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OPINIONS AND DECISIONS

OF THE

RAILROAD COMMISSION

OF THE

STATE OF WISCONSIN

VOLUME VII

JUNE 15, 1911, TO SEPTEMBER 23, 1911.

COMPILED BY
J. M. WINTERBOTHAM
Secretary

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OPINIONS AND DECISIONS

OF THE

Railroad Commission of Wisconsin

SOUTH MILWAUKEE FUEL AND SUPPLY COMPANY
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted April 4, 1911. Decided June 15, 1911.

Petitioner, in behalf of itself and other coal merchants in Cudahy and South Milwaukee, alleges that these stations, located seven and ten miles, respectively, from Milwaukee, are terminal points on respondent company's line, and that the rates on coal, coke and similar shipments from Milwaukee to Cudahy and South Milwaukee are higher than such rates to other terminal points in and about the city of Milwaukee; that such rates are unreasonable and discriminatory; that manufacturers at the various terminal points in and about Milwaukee enjoy lower rates on different commodities in carload lots than are available to persons not manufacturers; that the rate on coke from Chicago to South Milwaukee and Cudahy is 45 cts. per ton, and that the same rate is exacted from Milwaukee to those points, for one-tenth of the distance; and that the rates on coal between Milwaukee and South Milwaukee and Cudahy are now 35 and 40 cts. per ton, as against a former rate of 25 cts. Petitioner prays that refund be made to itself and the other dealers involved for all shipments which moved in the six months preceding the filing of this petition.

Respondent company had prepared a new tariff, which had been published but was not yet effective at the time of the hearing, which remedied these discriminatory conditions by placing all manufacturing districts in and about Milwaukee upon practically the same rate basis, and which does not discriminate between manufacturers and other consignees.

Held: That Cudahy and South Milwaukee should be placed, as to the shipments upon which refund is asked, upon the same basis as other manufacturing districts in and about Milwaukee, and refund is ordered on 224 of the 257 freight bills submitted by petitioner and the other coal merchants referred to, on the basis of $5 per car for Cudahy, and $6 per car for South Milwaukee, 50,000 lbs. minimum, excess at proportionate rates. The amounts mentioned herein are subject to change insofar as it may be found that respondent has absorbed switching charges, or that error has been made in the calculation.

The petitioner, a corporation dealing in coal, masonry supplies, sewer and water pipe, and sand, at South Milwaukee, Wis., makes its complaint on behalf of itself and of Caveney & Company and the Oak Creek Coal Company of South Milwaukee, and of C. F. Becker and Stan. Makowski of Cudahy, all of whom are engaged in the coal business. The principal allegations of the complaint are in substance as follows: That Cudahy and South Milwaukee are terminal points on the line of the respondent company, located, respectively, seven and ten miles south of Milwaukee; that the respondent company has eleven other terminal points in and about the city of Milwaukee, two of which are, respectively, six and nine miles from said city, and that all of these eleven terminal points are given a carload rate of one cent per 100 lbs. on coal, coke and similar shipments originating in Milwaukee, while the rates to Cudahy and South Milwaukee from Milwaukee are as follows: on coke, 2¼ cts.; on coal, to Cudahy, 1¾ cts.; on coal, to South Milwaukee, 2 cts.; that these rates to Cudahy and South Milwaukee, being more than double the rates to the other Milwaukee terminal points for substantially the same distance, are unreasonable and discriminatory. The petitioner further alleges that the manufacturers at the various terminal points in and about Milwaukee, including Cudahy and South Milwaukee, and at Carrollville, a point three miles south of South Milwaukee, enjoy rates ranging from $2 per car on corn, rye and hay originating on the respondent's line and re-consigned to Carrollville, to 0.8 cts. per 100 lbs. or 16 cts. per ton on other commodities in carloads, while the petitioner and others not manufacturers, at South Milwaukee and Cudahy, are required to pay the rates already mentioned, or approximately twice as much as the manufacturers at the same points must pay. The petitioner also complains of the rate on sand shipped from South Milwaukee to Milwaukee manufacturers, such shipments being expressly excepted in the respondent's tariff from the low rates given to manufacturers, as the result of which exception the petitioner must pay on sand approximately double the usual manufacturers' rate. The petitioner further alleges that the rate of 45 cts. per ton on coke from Chicago to South Milwaukee and Cudahy, a distance of approximately eighty miles, is the same as the rate on coke from Milwaukee to the same points, an average distance of approximately eight miles, or one-tenth of the hauling distance. Finally, the petitioner alleges that according to its belief the rate on coal between Milwaukee and Cudahy and South Milwaukee from 1904 to 1906 was 25 cts. per ton, as against the present rates of 35 cts. and 40 cts. Wherefore, the petitioner prays that reasonable rates be ascertained for the transportation of the above mentioned kinds of freight between Milwaukee and Cudahy and South Milwaukee, and that refunds be made to it and to the other dealers, on whose behalf it complains, upon all shipments within the six months immediately preceding the filing of the petition, upon the basis of the reasonable rates so ascertained.

The respondent company, in its answer, denies that the rates complained of are unreasonable or discriminatory, and asks for a detailed statement of the shipments upon which refund is asked. Such a statement was promptly filed by the petitioner.

The matter came on for hearing at Milwaukee, April 4, 1911. *W. J. Riley* appeared for the petitioner, and *W. G. Wheeler* for the respondent railway company.

The evidence upon the part of the petitioner was to the effect that previous efforts had been made to secure a lower rate on coal from Milwaukee to South Milwaukee and Cudahy, but that the petitioner had been given to understand that any change of rates would result in raising the rates to manufacturers at the same points, which apparently was not what the petitioner desired, and the matter was not pressed. It was further testified, in corroboration of the statement in the petition, that, as the result of requests made in 1904, the rate on coal from Milwaukee to Cudahy and South Milwaukee was made 25 cts. per ton, but that later, without any reasons being given for the change, the rate was changed to 35 cts. for Cudahy and 40 cts. for South Milwaukee, at which points the rates had remained up to the time of the hearing.

A representative of the respondent company explained that the city of Milwaukee and neighboring territory were not divided into thirteen terminal districts as was represented in the complaint, but that the petitioner's information as to such districts had been derived from a booklet issued by the respondent company some time ago in an attempt to develop the territory about Milwaukee as a manufacturing center, and the division of the territory therein made into manufacturing districts had nothing to do with rates. Testimony introduced by the respondent company tended to show that the low rates given to manufacturers at Cudahy and South Milwaukee, and not given to coal dealers at the same points, were intended to encourage the development of those points as manufacturing centers; that the manufacturers' rates were made before there were any industries at these points, and the needs of coal dealers and private consumers were not considered at that time. Much complaint had been made of recent years about the low rates awarded to the manufacturers at Cudahy and South Milwaukee, and it was only a question of time before their rates would be raised. It was stated as the theory of the respondent company that the coal dealers in these two cities were benefited by the low rates to factories in the general growth of the cities fostered by such rates, and that it was therefore in the interest of the dealers to have no readjustments made which would place South Milwaukee and Cudahy manufacturers upon the same rate basis as those at other points near Milwaukee; but that the complaint in the present case had precipitated matters and the only thing now to be done was to place all the points near Milwaukee upon a substantially similar rate basis. The extent to which the manufacturers at Cudahy and South Milwaukee have been favored is shown by the fact that, while the respondent's switching charge between points in the city of Milwaukee was $5 and $6 per car, the local rate to manufacturers at Cudahy was only $3 per car.

To remedy this discriminatory condition, the respondent company prepared a new tariff, G. F. D. No. 11442—B, which had been published but was not yet effective at the time of the hearing. Before the date of the effectiveness of this tariff, it was superseded by G. F. D. No. 11442—C, effective May 1, 1911, which, among other things, names coal rates as follows: hard coal, between Milwaukee and Cudahy and South Milwaukee, 1.5 cts. per 100 lbs. or 30 cts. per ton, minimum charge $6 per car; soft coal, from Milwaukee to Cudahy, 0.7 cts. per 100 lbs. or 14 cts. per ton, minimum charge $5 per car; soft coal, from Milwaukee to South Milwaukee, 0.8 cts. per 100 lbs. or 16 cts. per ton, minimum charge $5 per car. This tariff differs from G. F. D. 11442—B, which it cancels, in making the rate on soft coal 0.7 cts. and 0.8 cts. per 100 lbs. to Cudahy and South Milwaukee, respectively, instead of 1 ct. per 100 lbs. to both points. The new tariff places all the manufacturing districts about Milwaukee upon practically the same rate basis, includ- Cudahy and South Milwaukee, and does not discriminate between manufacturers and other consignees.

The petitioner objected to the introduction of the new tariff in evidence, upon the ground that the excessive charges complained of were collected before the tariff was published, and that the tariff therefore could not be material in determining whether the petitioner was entitled to a refund. The petitioner further insisted that the new tariff was not at all satisfactory from its point of view, inasmuch as it left the rate on hard coal nearly as high as it was before, while a large reduction had been made in the rate on soft coal. This was claimed to be an attempt to aid the manufacturers at the expense of the coal dealers, since the manufacturers use only soft coal and the coal dealers handle large quantities of hard coal.

The petition and the facts brought out at the hearing indicate that the grounds of complaint are the existence of lower rates to manufacturers at Cudahy and South Milwaukee than to persons not manufacturers, and also the fact that rates from Milwaukee to points about as far distant as Cudahy and South Milwaukee are in some cases lower than the rates to persons not manufacturers in Cudahy and South Milwaukee.

Taking up the first branch of the petitioner's claim, the testimony indicates that the reason for the lower rates given to the manufacturers was the desire of the respondent company to build up the territory south of Milwaukee industrially, so that the ultimate result would be an increase in the business of the respondent company. These lower rates, it seems, were put in force at a time when conditions were such that rates for other than manufacturers at Cudahy and South Milwaukee were not relatively so important as such rates have since become. It may be assumed, we believe, that the increasing importance of the rates for other than manufacturers was principally due to the increase in the business of the manufacturers and that the increase in the business of the manufacturers was due more or less to the favorable rates given them. It is probably a fact, though not clearly brought out in the testimony, that the manufacturing interests at Cudahy and South Milwaukee have directly caused the growth of most of the other industries at those points; and it is equally probable that at the time of the establishment of the factories, and for some time thereafter, the other industries were not greatly interested in the lower rates enjoyed by the manufacturers. The petitioner's testimony in regard to the abandonment of an attempt made about two years ago to secure a better rate for coal dealers seems to indicate the unwillingness on the part of the petitioner to pursue a course which would probably result in an increase in the rates for manufacturers. It seems to be true that in the case under consideration the commodities having lower rates when shipped to manufacturers did not come into competition with the commodities handled by the petitioner, and that, therefore, the lower rates had no effect whatever upon the petitioner's business, unless, perhaps, to increase it.

The practice of railroads in this state of making lower freight rates to manufacturers than to the general public, has been established a great many years. This practice is still continued to a greater or less degree, but the general tendency seems to be to reduce the number of these rates. As a general rule, such rates at present are restricted to commodities that go to manufacturers to be manufactured into other commodities, and to commodities that go to a concentrating point in less than carload lots, to be stored, worked over, and prepared for reshipment in carload lots. Such rates are almost invariably subject to the condition that the product shipped out from the manufacturing and concentrating points must be shipped over the railroad that hauled the original commodity to the manufacturing and concentrating points. No such condition is connected with the manufacturers' rates at Cudahy and South Milwaukee in force prior to May 1, 1911: but the manufacturers would necessarily ship out over the respondent's line because there is no other railroad at these points. The equity of lower freight rates for manufacturers than for the general public has been discussed by the Commission in other cases, and it is not necessary to go into the matter again in this case. It is sufficient to call attention to the fact that sec. 1797—6 of the Railroad Law is understood to authorize such rates, and to the fact that this principle has been recognized by the Commission in a number of cases. *In re Rates on Construction Material,* 1 W. R. C. R. 210: *Valvoline Oil Co. v. C. & N. W. R. Co. et al.* 2 W. R. C. R. 232; *Cochrane Co. v. C. M. & St. P. R. Co.* 3 W. R. C. R. 1.

That part of the petitioner's case, therefore, which is based upon the fact that the rates to manufacturers were lower at the time of the shipments in question than the rates to coal dealers at the same points, cannot be made the basis for a refund.

The second ground of the petitioner's case is that, leaving aside the manufacturers' rates, the ordinary local rates to Cudahy and South Milwaukee should not exceed similar rates to other manufacturing districts in and near the city of Milwaukee for like distances.

Previous to May 1, 1911, the rates between various manufacturing centers in the vicinity of Milwaukee, at distances from that city about equal to the distances from Milwaukee to Cudahy and South Milwaukee, were as follows:

SWITCHING RATES IN DOLLARS PER CAR
IN FORCE PREVIOUS TO MAY 1, 1911.

Between	Bay View.		Layton Park.		W. Allis.		North av.		Lindwurm.		Siding No. 6.	
	Mi.	Rate.	Mi.	Rate.	Mi.	Rate.	Mi.	Rate.	Mi.	Rate.	Mi.	Rate.
Layton Park..........	5	$6 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Allis............	8	6 00	3	$5 00	.....	.....	.....	.....	.....	.....	.....	.....
North Ave............	.....	6 00	.....	6 00	.....	$6 00	.....	.....	.....	.....	.....	.....
Lindwurm............	10	6 00	.....	.....	.....	.....	.....	$5 00	.....	.....	.....	.....
Siding 6..............	12	6 00	.....	.....	.....	.....	.....	5 00	.....	.....	.....	.....
Milwaukee............	4	5 00	6	5 00	9	5 00	.....	5 00	6	$6 00	8	$6 00

These rates are per car of 50,000 lbs. or less and are proportionately greater for loads over 50,000 lbs. The shortest distance shown on this table is 3 miles, and the longest is 12 miles. The rates, $5 and $6, do not vary with the distance in each instance, but the general variations indicate an intent to make the $5 rate applicable where the shorter distances occur, and the $6 rate where the distances are greater. Except for the manufacturers' rates to Cudahy and South Milwaukee, these rates are lower than rates for similar distances in almost any other part of Wisconsin; but traffic conditions, no doubt, between Milwaukee and the manufacturing districts in the vicinity of that city are somewhat different from traffic conditions in other parts of the state. The respondent, in making the rates given in the above table, has recognized the special conditions in that territory; and in issuing the new tariff, effective May 1. 1911, making nearly all the rates between Milwaukee and Cudahy and South Milwaukee the same as those between Milwaukee and the other neighboring manufacturing districts, it has recognized that similar special conditions now prevail between Milwaukee and Cudahy and South Milwaukee. Not only does the new tariff equalize the manufacturers and other consignees at Cudahy and South Milwaukee, but in most cases it places these two points on an equality with Layton Park, West Allis, Lindwurm, and the other manufacturing centers near Milwaukee; except that as to soft coal shipments Cudahy and South Milwaukee are given, respectively, 0.7 ct. and 0.8 ct. rates per 100 lbs., while the rate to the other points is 1 ct. per 100 lbs. On some other commodities the new tariff results in slight increases over the old, but it is not possible, without full information as to what commodities actually move between these points, to say whether these increases are of any importance. The effect of the new tariff that needs especial consideration here, is the fact that it places Cudahy and South Milwaukee upon practically the same basis as the other manufacturing districts in and near Milwaukee, and even favors these points slightly in the rate on soft coal.

The respondent's testimony shows that it has been recognized for some time that Cudahy and South Milwaukee should be upon the same basis as the other manufacturing points. Just how long the conditions at these two points have been recognized to be practically the same as those at the other manufacturing centers, was not brought out at the hearing. The Commission is called upon in this case to determine what would have been the proper rates to apply to certain shipments between Milwaukee and Cudahy and South Milwaukee during the period from July 16, 1910, to Jan. 16, 1911, the six months immediately preceding the filing of the complaint in this case. The statements made at the hearing by representatives of the respondent company seem to warrant the assumption that conditions were such during the period referred to that shipments between Milwaukee and Cudahy and South Milwaukee were entitled to rates no higher than those in force between the other manufacturing districts surrounding Milwaukee, viz., $5 and $6 per car. An examination of them indicates that they are lower than most rates for similar distances between other points in the state, but, as has been said before, conditions in the vicinity of Milwaukee differ from those in other parts of the state. Our cost analysis also indicates that the new rates just quoted, while not as profitable to the respondent as many other rates for like services, still yield fairly good returns on the services and the investment involved.

In view of these facts it would seem reasonable that Cudahy and South Milwaukee be placed, as to the shipments on which refund is asked, upon the same basis as the other manufacturing districts in and near Milwaukee at the time the shipments moved, and that this can be accomplished by authorizing a refund on the basis of $5 per car to Cudahy, and $6 per car to South Milwaukee, with 50,000 lbs. minimum in each case, excess at proportionate rates.

Paid freight bills to the number of 257 were offered in evidence at the hearing, including all the shipments on which refund is asked by the petitioner and the other four parties on whose behalf the petitioner complains. An examination of these bills shows that eighteen of those presented by the petitioner and fifteen of those presented by Cavaney & Company cannot be made the basis of a refund, for the following reasons: eleven are for through interstate shipments; four are for shipments moving more than six months before the filing of the complaint; fourteen are for shipments from Eden, Wis., on a rate as to which no complaint is made; four are for shipments on which the respondent company receives less charges than would accrue upon the basis of the authorized refund. The remaining 224 bills are entitled to consideration for a refund.

It is noted that one of the bills bears the notation, "$2 switching charge absorbed." This, together with the fact that some of the shippers are not shown in the tariffs to be located on the respondent's tracks, indicates that the respondent paid and absorbed a switching charge of a connecting line at Milwaukee on some of the shipments. Since the Commission has not the necessary information at hand to enable it to determine upon which shipments the switching charges have been absorbed, the 224 paid freight bills will be sent to the respondent company for checking and correction of such errors as may have been made, and for deductions on account of switching charges paid to other lines at Milwaukee by the respondent company.

The amount of the refund to be granted to the several parties on whose behalf the petition is brought, is made up by the Commission from the freight bills as follows:

South Milwaukee Fuel & Supply Co., South Milwaukee.

78 freight bills on which charges paid amount to	$993 19
Same bills at $6 per car of 50,000 lbs., excess in proportion	594 10
Amount of refund authorized	$399 09

Oak Creek Coal Co., South Milwaukee.

36 freight bills on which charges paid amount to	$426 73
Same bills at $6 per car of 50,000 lbs., excess in proportion	262 36
Amount of refund authorized	$164 37

Caveney & Co., South Milwaukee.

59 freight bills on which charges paid amount to	$754 70
Same bills at $6 per car of 50,000 lbs., excess in proportion	376 05
Amount of refund authorized	$378 65

Caveney & Co., Cudahy.

10 freight bills on which charges amount to	$125 11
Same bills at $5 per car of 50,000 lbs., excess in proportion	62 43
Amount of refund authorized	$62 68

C. F. Becker, Cudahy.

20 freight bills on which charges amount to	$206 59
Same bills at $5 per car of 50,000 lbs., excess in proportion	120 70
Amount of refund authorized	$85 89

Stan. Makowski, Cudahy.

21 freight bills on which charges amount to	$243 46
Same bills at $5 per car of 50,000 lbs., excess in proportion	135 95
Amount of refund authorized	$107 51

These amounts are subject to change insofar as it may be found upon checking them over that the respondent company has absorbed switching charges or that error has been made in the calculation. In case of disagreement between the petitioner or the other dealers represented in this petition and the respondent company, as to the facts regarding any of the shipments, the Commission will take up the matter again and secure an adjustment upon the merits of the case.

That part of the petitioner's complaint which relates to the failure of the respondent company to give the petitioner the regular manufacturers' rates on sand shipped by it to manufactures in Milwaukee from South Milwaukee, need not be considered here, since none of the shipments on which refunds are asked involve this commodity, and the new tariff, effective May 1, 1911, does away with special rates to manufacturers.

We therefore find that the rates exacted of the petitioner and of the other parties on whose behalf the petitioner makes its complaint, for carload shipments of coal, coke and similar products during the six months previous to Jan. 16, 1911, from Milwaukee to Cudahy and South Milwaukee, are excessive, and that a reasonable rate for the service rendered would be the rate of $5 per car, 50,000 lbs. minimum, excess at proportionate rates, from Milwaukee to Cudahy, and $6 per car, 50,000 lbs. minimum, excess at proportionate rates, from Milwaukee to South Milwaukee.

IT IS THEREFORE ORDERED, That the respondent, the Chicago & North Western Railway Company, refund to the South Milwaukee Fuel & Supply Company, Caveney & Company, C. F. Becker, Stan. Makowski, and the Oak Creek Coal Company, the amounts respectively determined above to be due to them as refunds upon the shipments aforesaid, provided, that as to any shipments upon which it shall be found that the respondent company has absorbed a switching charge, allowance for such absorption shall be made in computing the amount of the refund.

RUST OWEN LUMBER COMPANY
vs.
CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY.

Decided June 20, 1911.

Petition alleging overcharges on various shipments of logs from Marston Spur and Roxby to Drummond; the rate contended for had been effective before July 1, 1910, and was again made effective on Jan. 14, 1911, after the shipments involved herein had moved.

Held: That the charges exacted were unusual and exorbitant, and refund is ordered.

The petitioner is a corporation engaged in the manufacture of lumber with its offices at Drummond, Wis. It alleges that on June 3, 1910, the respondent put into effect a rate of $1 per 1,000 ft., or a minimum charge of $5 per car on logs for the purpose of hauling for petitioner certain logs from Marston Spur and Roxby to Drummond; that such rate was to remain in effect until July 1, 1910, unless sooner rescinded, changed or extended; that petitioner was not informed when this tariff would be canceled, and such copy of tariff was not filed with petitioner for its information; that it did not haul all the logs from Marston Spur contemplated when asking for this rate in 1910, but commenced to haul again on Jan. 5, 1911, at which time petitioner was not aware that said rate had been canceled; that respondent put this same rate into effect again at petitioner's request on Jan. 14, 1911, to enable petitioner to complete the hauling of logs from this point; that petitioner believes it is entitled to the lower rate on all logs hauled from Marston Spur, whether in 1910 or 1911, and to a refund of the difference between the published rate and the special rate of $5 per car, or $24.88 on the four cars shipped on Jan. 5 and 9, 1911, and the respondent has expressed its willingness to make the refund if it is given authority so to do.

The respondent, answering the petition, admits all the formal allegations thereof and alleges that it is willing to make reparation on a basis of the rate, $1 per 1,000 ft., minimum charge $5 per car, on logs from Marston Spur to Drummond, Wis.

The claim was submitted upon the pleadings and papers and vouchers on file.

After an investigation of the said claim, and in conformity with the agreement of the parties, we find and determine that the charge exacted of the petitioner for the aforesaid shipments are unusual and exorbitant, and that a reasonable charge for such shipments would have been based on a rate of $1 per 1,000 ft., or a minimum of $5 per car.

NOW, THEREFORE, IT IS ORDERED, That the Chicago, St. Paul, Minneapolis & Omaha Railway Company be and it is hereby authorized to refund to said Rust Owen Lumber Company the sum of $24.88.

EDWARD HINES LUMBER COMPANY
vs.
CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY.

Decided June 21, 1911.

Petition alleging overcharges on shipment of seven cars of lumber from Ashland to Hayward.

Held: That the rate exacted by respondent was unreasonable, and refund is ordered.

The petitioner is a corporation engaged in the manufacture of lumber and forest products, at Hayward and other points in the state of Wisconsin. It alleges that seven cars of lumber were consigned to it from Ashland for the purpose of manufacture and re-shipment from Hayward via the respondent's line; that the aggregate weight of the lumber as loaded in these cars was 352,600 lbs., and that the respondent assessed freight thereon on the basis of 5 cts. per cwt., or $176.30.

The rate thus exacted, the petitioner claims, is exorbitant and unreasonable, because the rate charged on lumber from Ashland, Washburn, and Hayward is the same to Madison, Baraboo, La Valle, and Union Center and other points, all being 12 cts. per cwt., as per respondent's tariff G. F. D. 1360—C, first effective Aug. 25, 1909, and which was effective at the time shipment in question moved; and because lumber shipped from Ashland or other points to Hayward is not consumed at Hayward, but is manufactured and re-shipped via respondent's lines to final destination, as per their regular tariffs.

Petitioner contends that a rate of 2 cts. per cwt. from Ashland or Washburn to Hayward over the respondent's lines is reasonable, particularly in view of the fact that all material being shipped to Hayward is to be re-shipped over respondent's line and freight charges collected on the basis of their published tariff from Hayward to destination; that the reasonableness of a rate of 2 cts. per cwt. is fully confirmed by the fact that since said shipment moved respondent has amended its tariff G. F. D. 2400, publishing the rate of 2 cts. per cwt., same being originally issued in supplement 6, item 54—a, to respondent's tariff G. F. D. 244, same now being carried in supplement 14 to same tariff as enumerated.

Petitioner further contends that in handling freight from Ashland or Washburn to Madison or various other points, the expense to respondent is practically no more if shipment is first billed to Hayward, set out, re-loaded and re-shipped to its destination, than if shipment is not stopped in transit.

Respondent now collects full tariff rate according to its regular published tariffs now effective from Washburn or Ashland to destination, plus 2 cts. per cwt., tariff now effective from Ashland or Washburn to Hayward, which petitioner contends more than pays for the extra handling of the equipment at Hayward and which is an assessment of 3 cts. per cwt. more than the now published tariff.

Petitioner therefore asks refund in the amount of $105.86.

The respondent, in answering the petition, admits all the formal allegations thereof, but denies that the expense to respondent in handling freight from Ashland or Washburn to Madison or various points in Wisconsin is practically no more if shipment is first billed to Hayward, set out, re-loaded and re-shipped from that point, but alleges, on the contrary, that the expense of handling said shipments is materially increased.

The respondent alleges, however, that for some time prior to the shipments mentioned in the complaint it had a $5 per car rate on lumber from Ashland to Hayward, for manufacture and re-shipment, and further alleges that said rate had not been used for some time, on account of which same was canceled, but that shortly after said cancelation the shipments in question moved and, on advice of the movement, respondent established a rate of 2 cts. per cwt. It further alleges that it is willing to make reduction to a basis of 2 cts. per cwt., if proper authority is received therefor, and admits that the rate contended for is just and reasonable.

The claim was submitted upon the pleading, papers, vouchers and documents on file.

Investigation shows that a $5 per car rate was never in effect on respondent's lines between points mentioned, and respondent now admits the error.

The facts of the above case are similar to those in *Manson & Weinfeld v. C. M. & St. P. R. Co.* 4 W. R. C. R. 362.

Inasmuch as respondent has admitted the justice and reasonableness of the rate contended for and its willingness to refund on that basis, a discussion of the considerations leading to the conclusion of the unreasonableness of the former rate is unnecessary.

The following is a correct statement of the shipments and the amounts paid to the railway company at a rate of 5 cts. per cwt., and also the amounts paid in excess of a rate of 2 cts. per cwt.:

To Hayward, Wis. from.	Date 1910.	Statement of Billing.					As Claimed.		
		Way bill No.	Car No.	Weight	Rate.	Chgs.	Rate.	Chgs.	Claimed over-charged.
Ashland, Wis.....	Dec. 9.	293	28,502	35,000	5	$17 50	2	$7 00	$10 50
Ashland, Wis.....	Dec. 9.	294	73,186	56,900	5	28 45	2	11 38	17 07
Ashland, Wis.....	Dec. 9.	295	29,016	52,000	5	26 00	2	10 40	15 60
Ashland, Wis.....	Dec. 9.	296	28,016	51,800	5	25 90	2	10 36	15 54
Ashland, Wis.....	Dec. 10.	320	28,118	49,800	5	24 90	2	9 96	14 94
Ashland, Wis.....	Dec. 10.	321	67,287	*30,000	5	15 00	2	6 80	8 20
Ashland, Wis.....	Dec. 12.	354	8,703	76,700	5	38 35	2	15 34	23 01
		......	....	352,200	......	$176 10	......	$71 24	$104 86

*L. S. & M. S. car 67287 is a 36 ft. car. Should take a minimum weight of 34,000 lbs.

We therefore find and determine that the rate of 5 cts. per cwt., exacted of the petitioner by the respondent for the aforesaid shipments of lumber from Ashland to Hayward, Wis., is unreasonable, and that a reasonable rate to have charged for such shipment would have been 2 cts. per cwt., in accordance with tariff now in effect.

Now, Therefore, it is Ordered, That the Chicago, St. Paul, Minneapolis & Omaha Railway Company refund to the said Edward Hines Lumber Company the sum of $104.86, being the excess charge exacted as aforesaid.

LINDSAY BROTHERS
vs.
MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY.

Decided June 21, 1911.

Petition alleging overcharges on various shipments of vehicles and agricultural implements from Milwaukee to different points in Wisconsin.

Held: That the rate charged by respondent was unusual and exorbitant and refund is ordered.

The petitioner is engaged in the sale of vehicles and agricultural implements at Milwaukee, Wis. It alleges that during the months of November 1910 and February 1911 it shipped a number of cars containing vehicles and agricultural implements to different points in the state of Wisconsin, consigned over the lines of the respondent. It contended that on one carload shipped to Westfield, respondent charged petitioner 21 cts. per cwt., on car to Marshfield 20 cts. per cwt., on car to Packwaukee 21 cts. per cwt., on car to Plainfield 21 cts. per cwt., on car to Amherst Jct. 19 cts. per cwt.; that at the time of forwarding these shipments the respondent carried in its tariff G. F. D. No. 12200, as amended by supplement No. 1, a rate of 18 cts. per cwt. on vehicles in carloads from Chicago to Westfield and Marshfield, Wis., and that, through an error, omitted to carry the same rate from Milwaukee, which rate had been carried previously for a period of years in tariff W. C. No. C 248; that it was unreasonable and unjust to charge a higher rate from Milwaukee than was in effect from Chicago, and that the said rates of 20 cts. and 21 cts. per cwt. charged were unlawful, in view of the fact that it had subjected petitioner and its traffic to undue prejudice and disadvantage; that petitioner is thereby injured to the extent of $25.11, which is the difference between the amount charged and what charges would have been on the basis of an 18 ct. rate in effect from Chicago.

The respondent, answering the petition, admits all the formal allegations thereof, and agrees to refund the overcharge of

$25.11 to the petitioner if upon the investigation the Commission finds petitioner is entitled to it.

The facts in the case are similar to those in *Beaver Dam Malleable Iron Works v. C. M. & St. P. R. Co.* 2 W. R. C. R. 703.

We therefore find that the rate charged petitioner by the respondent in the aforesaid shipments of vehicles and agricultural implements is unusual and exorbitant, and do also find that a rate of 18 cts. per cwt. would have been a reasonable charge for such services.

Now, THEREFORE, IT IS ORDERED, That the Minneapolis, St. Paul & Sault Ste. Marie Railway Company refund to petitioner the sum of $25.11, being the amount collected by the respondent and found to be in excess of a reasonable charge for services rendered.

THE WASHINGTON PARK ADVANCEMENT ASSOCIATION
vs.
THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY.

Submitted Nov. 25, 1910. Decided June 21, 1911.

Petition alleging that respondent's street railway service on the Walnut Street line in the city of Milwaukee is irregular and inadequate. After analyzing the data on file and those gained by a number of observations of the traffic on the line involved, it was

Ordered: That respondent establish a regular schedule on said line of eight minutes headway throughout the day; that extra cars be added during the maximum periods of travel, so as to reduce such headway during such periods to three minutes on the north side of the city, and to four minutes on the south side.

The petitioner is an association of citizens residing in the vicinity of Washington Park in the city of Milwaukee, Wis., and has for its purpose the promotion of the growth and development of that section of the city. It alleges that the respondent street railway company's service on the Walnut Street line, extending from Twelfth street to the western limits of the city, is irregular and inadequate; wherefore, petitioner prays that the service on the said line be rendered regular and adequate for the needs of the public.

Respondent railway company, answering the petition, alleges that the petitioner is not a mercantile, agricultural or manufacturing society, and is not a person, society or association in any way authorized or empowered to institute any complaint or proceeding before the Railroad Commission of Wisconsin; that as a part of respondent's street railroad system it operates a street railway line from Twelfth street in said city of Milwaukee to the intersection of Sherman boulevard and Lisbon avenue, and from said intersection of Sherman boulevard and Lisbon avenue it operates its street railway line to the intersection of Lisbon avenue and North avenue, and also from said intersection of Sherman boulevard and Lisbon avenue it operates its street railway line west to 48th street. Further answering the petition, the respondent denies that the service rendered by it on its street railway lines above described, or on any of them, is irregular or inadequate, and, on the contrary, alleges that the service rendered by it on its street railway lines above mentioned at all times has been and is now better than reasonably adequate.

The matter came on for hearing at the city of Milwaukee on Nov. 25, 1910. The petitioner was represented by *Gustav Schmitt,* its president, and the respondent was represented by *Miller, Mack & Fairchild,* its attorneys.

The respondent contends that, as the petitioner is not a mercantile, agricultural or manufacturing society, it cannot invoke the jurisdiction of the Commission in the proceedings here instituted. This objection is not tenable, for the reason that sec. 1797—12 provides that the Commission may take jurisdiction of the matters herein complained of "upon complaint of any person, firm, corporation or association, or of any mercantile, agricultural or manufacturing society, or of any body politic or municipal organization." The objection seems to be based upon the provisions of sec. 1797m—43 of the Public Utilities Law, which has no application here.

In arriving at the correct amount of service to be given by a street railway company on any line, it is essential to measure as closely as possible the amount of service unconsciously required by the public at all times of the day and under varying conditions.

There are two sets of data before us which give sufficient information for determining the character of the Walnut Street—National Ave. line. One set of data is embodied in a complete analysis of the Milwaukee traffic requirements by the Commission, giving a means for measuring the demand for service along any line, as well as a measure of the amount of service each line renders to other lines as a tributary. The other set consists of a number of observations along the Walnut Street—National Ave. line at 12th and Walnut st., 27th and Lisbon st., and 35th and Lisbon st. These observations show the conditions existing on three days and were submitted as evidence by the petitioner upon the hearing.

An analysis of both sets of data shows that the distribution of traffic is unequal in amount throughout the day. In each case it developed that there are three distinct periods of travel as follows: 6 to 9 a. m.; 11 a. m. to 2 p. m.; and 5 to 8 p. m.

The amount of travel during any one of these periods is unequally distributed, that is to say, the travel during one portion of the period is much greater than that during the remaining portions. This condition is especially noted to exist during the morning and evening periods of travel. It naturally follows, therefore, that the greatest instantaneous demand for service exists during the portion of each period when the travel is maximum. All requirements for service, as well as defects in accommodations, exist in their greatest degree of effectiveness during these peak conditions. Any routing of cars or service rendered that will serve adequately the conditions met in these peak periods will satisfy the demand at any other time of the day.

The facts show that the Walnut Street—National Ave. line is composed in reality of two distinct parts: one including the north portion connecting 35th and Lisbon streets with West Water and Grand ave. via Lisbon, Walnut, 3rd, and West Water; while the other connects West Water and Grand ave. with parts along National ave. via West Water and Reed streets.

During the morning period of maximum travel the cars receive their load going into town from 35th st. and Lisbon ave. to 12th and Walnut streets, along Lisbon ave. and Walnut st. The load changes very little (possibly an occasional slight decrease in amount) until the cars reach West Water st. and Grand ave. At this point the loading begins to decrease very rapidly and continues to do so until Reed st. and National ave. is reached. Here the cars going west receive a large number of passengers who desire to reach points as far west as West Allis. These conditions of travel are practically reversed during the evening peak period.

The demand for service causes much crowding in cars going to town during the morning peak from Fond du Lac ave. and North ave. to West Water st. and Grand ave. From a "comfortable loading" point of view that portion of the line along National ave. has reached and is exceeding the carrying capacity furnished by the present schedule. Corresponding conditions exist during the evening peak period.

The data contained in the testimony refers to that section of the north half of the line intervening between 12th and Walnut streets and the end of the line on Lisbon ave. The congested portion of this section is but a small fraction of the entire congested part of this half of the line. For this reason the information contained in the testimony has been closely compared with the detailed results of the Commission's investigation. The results of this analysis are embodied in tables I to VI, following. Tables I to IV are based upon data secured by the Commission, while tables V and VI are compiled from data contained in the testimony.

TABLE I.

. ESTIMATE OF CARS REQUIRED FROM WEST WATER ST. AND GRAND AVE. TO END OF LINE ON LISBON AVE.

A. PREVAILING DIRECTION OF TRAVEL—IN.

Cars required during morning peak load of travel—6 to 8 a. m.

Place.	Average number passengers per car.	Total cars operated between 6—8 a. m.	Total passengers between 6—8 a. m.	Passengers per hour.	Cars required per hour.
27th and Lisbon ave..........	30	27	810	405	8
Walnut and 12th sts..........	64	25	1,600	800	16
3rd and Walnut sts...........	64	25	1.600	800	16
West Water and Grand ave..	55	23	1,265	632	13

Average number of cars operated through territory per hour—13.
" " " " required " " " " —13.

TABLE II.

B. PREVAILING DIRECTION OF TRAVEL—OUT.

Cars required during evening peak period of travel—5 to 7 p. m.

Place.	Average number passengers per car.	Total cars operated between 5—7 p. m.	Total passengers between 5—7 p. m.	Passengers per hour.	Cars required per hour.
27th and Lisbon ave..........	35	27	945	472	9
Walnut and 12th sts..........	53	24	1.272	636	13
3rd and Walnut sts...........	63	27	1.701	850	17
West Water and Grand ave..	46	27	1,242	621	12

Average number of cars operated through territory per hour—13.
" " " " required " " " " —13,

TABLE III.

II. ESTIMATE OF CARS REQUIRED FROM WEST WATER AND GRAND AVE. TO END OF LINE ON NATIONAL AVE.

A. PREVAILING DIRECTION OF TRAVEL—OUT.

Cars required during morning peak period of travel—6 to 7 a. m.

Place.	Average number passengers per car.	Total cars operated between 6—7 a. m.	Total passengers between 6—7 a. m.	Passengers per hour.	Cars required per hour.
Reed st. and National ave...	49	13	637	637	13
38th and National ave........	53	12	636	636	13

Average number of cars operated through territory per hour—12.
" " " " required " " " " —13.

TABLE IV.

B. PREVAILING DIRECTION OF TRAVEL—IN.

Cars required during evening peak period of travel—5 to 6:30 p. m.

Place.	Average number passengers per car.	Total cars operated between 5 — 6:30 p. m.	Total passengers between 5 — 6:30 p m.	Passengers per hour.	Cars required per hour.
Reed st. and National ave...	41	18	738	492	10
38th and National ave.......	39	16	624	416	8

Average number of cars operated through territory per hour—11
" " " required " " " —9

TABLE V.

III. ESTIMATE OF CARS REQUIRED FROM TWELFTH AND WALNUT STS. TO END OF LINE ON LISBON AVE.

A. PREVAILING DIRECTION OF TRAVEL—IN.

Cars required during peak period of travel—6 to 8 a. m., as shown by data averaged for Nov. 18 and 21, 1910.

Place.	Average number passengers per car.	Total cars operated between 6—8 a. m.	Total passengers between 6—8 a. m.	Passengers per hour.	Cars required per hour.
27th and Lisbon ave..........	38	29	1,102	551	11
12th and Walnut sts..........	61	28	1,708	854	17

Average number of cars operated through territory per hour—14
" " " required " " " —14

TABLE VI.

B. PREVAILING DIRECTION OF TRAVEL—OUT.

Cars required during peak period of travel—5 to 7 p. m., as shown by data averaged for Nov. 18 and 21, 1910.

Place.	Average number passengers per car.	Total cars operated between 5—7 p. m.	Total passengers between 5—7 p. m.	Passengers per hour.	Cars required per hour.
27th and Lisbon ave..........	44	27	1,188	594	12
12th and Walnut sts..........	62	28	1,736	868	17

Average number of cars operated through territory per hour—14
" " " required " " " —14

The facts in the case indicate a distortion of schedule during peak periods of travel averaging 23 1/3 per cent for in-bound loaded cars, and 27 2/3 per cent for out-bound loaded cars. From this it is considered that 25 per cent is a fair average for all conditions during peak periods.

The rate of flow of passengers, so to speak, is varied and rather difficult to predict. There are, however, certain habitual movements of the traveling public that are constant in direction and amount, and at the same time there exists a certain class of traffic that is continually fluctuating in amount, direction, location, etc. Examples of this class are passengers going to and from parties, shows, special entertainments, shopping, etc. The company seldom has any warning of special demands of this character, consequently there will be unexpected demands for service and occasionally unavoidable overcrowding of cars. With this in view, the traffic diversity factor of 15 per cent has been used in connection with all calculations made in determining the headway necessary to give adequate service.

Table VII, following, is compiled from tables I to VI, inclusive, and gives a means for comparing the number of cars required as estimated from both sets of data, with the number of cars observed in each case:

TABLE VII.

Portion of line.	Time of day.	Max. No. of cars op. past any point per hr.	Av. No. of cars op. per hour.	Max. No. of cars required per. hr.		Av. cars req. per hour.	As shown by testimony.				
							Max. No. of cars op past any point per hr.	Av. No. of cars op. per hour.	Max. No. of cars required per hour.		Av. cars req. per hour.
				No.	Place.				No.	Place.	
West Water and Grand Av to End of line on Lisbon Ave.	6–8 a. m.	13¼	13	16	Walnut. 12th and 3rd & Walnut.	13	14½	14	17	12th and Walnut.	14
	5–7 p. m.	13¼	13	17	3d & Walnut.	13	14	14	17	12th and Walnut.	14
West Water and Grand Av to End of line on Nat'l Ave.	6–7 a. m.	13	12	13	Along National	13					
	5—6:30 p. m.	12	11	10	Reed and Nat'l Ave	9					

Now, Therefore, it is Ordered, That the respondent street railway company establish a regular schedule of headway on the aforesaid line of eight minutes throughout the day; that additional cars or trippers be added at times so as to establish the following time spacing of cars during the maximum periods of travel:

From West Water and Grand ave. to end of line on Lisbon ave.:

6 to 8 p. m.—3 minutes
5 to 7 p. m.—3 minutes; and,

From West Water and Grand ave. or that vicinity to end of line on National ave.:

6 to 7 a. m.—4 minutes
5 to 6:30 p. m.—4 minutes

WILLIAM TORRANCE, ET AL.
vs.
BOARD OF WATER COMMISSIONERS OF THE CITY OF LA CROSSE.

Submitted Nov. 1, 1910. Decided June 21, 1911.

Petition alleging that the water works system in the city of La Crosse is unable to supply the demand for water; that the mains are too small and the pressure inadequate during a large part of the summer season; that the intakes in the river are often buried in sand, and that they are now cut off on the city side of the main channel, so that sewage is pumped into the water mains, thereby endangering the health of the people.

The water is now taken from the Mississippi river, and an investigation showed that the continued use of this water, whether drawn directly from the river or from a lagoon in the city park, would require the installation of a filtration plant. Professor Slichter, of the University of Wisconsin, made an investigation of the ground water supply available, and for this purpose drove six test wells. The capacity of such wells was determined and the water therefrom analyzed chemically and examined bacteriologically, and compared with the water from the Mississippi river. It was shown that the ground water supply was adequate and the quality excellent. It is recommended that the city of La Crosse buy at least eighty acres of the land where the test wells were driven, and at once proceed to develop a municipal supply from the underflow gravel in the valley of the La Crosse river.

Ordered: That the city of La Crosse take the necessary steps for securing and maintaining permanently a reasonable supply of wholesome water, and that it place its machinery and appliances in the proper condition to maintain adequate pressure for serving its consumers and for the extinguishing of fires.

Twenty-five citizens of the city of La Crosse have filed a petition against the city and its board of water commissioners, wherein they allege that the city has outgrown the present water works, and such works are unable to supply the demand for water; that the water mains are too small, and because of the long distances are inadequate to furnish pressure enough to force the water to bath rooms located on the second floors of residences, during a large part of the summer season; that during the sprinkling hours certain sections of the city have only from five to ten pounds of pressure; that all of the public drinking fountains are supplied with water from artesian wells; that on account of the construction of wing dams by the government, the intakes from the river have, from time to time, been buried in sand and are now cut off on the city side of the main channel, so that the pumping plant is pumping sewage into the water mains, thereby causing great danger to health; that water meters are ruined by sand and filth; that parts of dead fish, clams, snails and shells are forced into the meters and service pipes; that such conditions increase in intensity as new consumers are added to the system and the system is extended; that during the past various remedies have been suggested for improving the conditions of the water system, but without results; that the city is at present being exposed to, and threatened with diseases, pestilence, etc., all danger of which can be quickly avoided if the people were supplied with pure, clean and wholesome water in an abundant supply, and at a cost which the people are willing to pay. Wherefore, petitioners pray that the matter be investigated, and that the city be compelled to render its water system adequate and efficient to provide wholesome, pure and clean water for domestic and other purposes.

The matter came on for hearing at the city of La Crosse on Nov. 1, 1910. The following appearances of leading citizens of La Crosse were entered: *William Torrance*, petitioner, *James P. Day*, chairman of board of public works, *George P. Bradish*, city engineer, *John A. Daniels*, *Dr. W. A. Anderson*, *A. Hirsheimer*, *C. W. Dickenson*, *Alderman Collins* and *W. A. Wolfe*.

The city of La Crosse owns and operates the water works which supplies the city and its inhabitants with water. The plant was installed about thirty-five or forty years ago for the purpose of supplying fire protection. At that time water for domestic consumption was taken from numerous private wells located throughout the city, and every family had either a barrel or cistern for storing rain water. The pumping for the city system was at first performed by private individuals, but in 1881 the city erected its own pumping station, and has since operated the plant. However, in cases of emergency it has been required to call upon the pumping stations of manufacturing plants within the city, which are connected with the city system, for the purpose of assisting in keeping up the pressure. The supply of water is taken from the Mississippi river.

It is not generally used for drinking purposes. With the development of the sewerage system the demand for domestic consumption increased, and the plant was extended to meet the requirements for public and private consumption. Mr. Bradish, the efficient engineer of the city, in a paper read before the business men of the city, gives an interesting and accurate account of the history and development of the city's water system and the present condition of the same. A clear exposition of the situation which confronts the city at the present time by reason of the impurity of its water supply and the inefficiency of its water system is stated by Mr. Bradish in his paper, and we therefore take the liberty to quote from the same:

"In the year 1895 the city partly realized the condition of the water system. The demand for water due to the numerous consumers and patrons of the water system was so great and was increasing so fast that the small pumps could barely supply the demand, and the passing of the lumber interests would soon leave the city with no fire protection at all, therefore the pumping station was increased in size, the 10 million gallon pump installed, a second 30″ intake extended from a new well into the river, and the 16″ main replaced with a 20″. The two, wet wells were, a little later, connected, but at a point from 3½ feet above the "O" of the river gauge. At the close of the year 1895 the general conditions of the water system are as follows: A 24″ intake from the river to well No. 1, this intake was placed below the low water mark and water flows freely from the river to the well. The 2 million and 4 million gallon pumps are each connected into this well and discharging through 12″ outlets into the 20″ main. A 30″ intake from the river to wet well No. 2, but connected therewith on the principle of a syphon, which for its flow depends on the water level in the well, always being lower than the water in the river, and the flow through the same diminishing in quantity as the difference in levels grows less. This intake is supplied with an air pump to remove the air therefrom, caused either by air in the water or entering the same through any break in the pipe. One 10 million, one 4 million, one 2 million gallon pumps, 29.34 miles of mains, about 2,000 taps, and no meters.

Year	Total gallons.	Miles mains	No. taps.	No. meters.	Receipts.	Expenses.	Rep. M gal	Exp. M gal.
1895........	....	29.34	..	......	....	....	....	....
1900........	1,776,030,440	39.24	2,478	00	$32,628 83	$19,121 41	$0.0184	$.0108
1905........	1,051,973,200	52.11	3,193	696	36,715 91	18,943 01	.0350	.0180
1909........	1,142,823,070	58.22	3,902	1,351	41,945 21	19,960 52	.0367	.0166
1910........	663,903,050	58.22	4,175	1,538	to July 15, '10.	....	....	....

"During the year 1903 the 10 M gallon pump was entirely overhauled and many parts rebuilt, so that from that time to the present it has been considered a much better and a more highly efficient engine than at its installation. The receipts and expenditures for the year 1910 can not be determined until the end of the year, but thus far all returns show it to be the banner year.

"Comparing the year 1909 with the year 1895, the time of installing the present water plant, we will find that there has been added to our system of mains, 28.88 miles of pipe, or an increase in the mains of a little more than 98 per cent. The taps have increased from about 2,000 to 4,175, or a little more than 108 per cent, and in that time 1,538 meters have been installed, leaving less than 30 per cent of the taps metered. The system of laterals leading from the mains is as follows: practically the same size pipe are carried both north and south from that main. A 16″ main extends west from the pump station to Front st. and on Front st. there is an 8″ lateral, on 2nd st. a 12″ lateral extends north through the business section, across the causeway to the north side, as far as Wood and North streets. On 3rd st. there is an 8″ pipe. On 4th, 5th and 6th streets 6″ laterals are taken off. On 7th st. an 8″. On 8th, 9th, 10th and 11th streets 6″, and on 12th or West avenue there is a 12″. Such is the condition of the laterals today.

"About two years after the 30″ intake was installed, it filled with sand. It was then taken up, cleaned and replaced. Some two or three years later it again filled with sand and it was then decided to cut it off. This was accomplished by taking out two sections of pipe back of the point where it was filled with sand, and this point of cut-off is today less than 30 feet from the shore or low water line, and due to the fact that a few years ago the Mil. R. R. pushed its track out some 50 feet or more into the river just back of the Listman mill, the end of this intake is not in the direct current of the river.

"It is not the province of this paper to criticise the action nor find fault with any official connected with the city or with the water department, past or present, but to state the facts and conditions of the present water plant and those leading up to the proposed system.

"During the long dry spell in 1910, when the demand for water was such that it taxed the capacity of the present plant to its utmost, and at certain hours of the day the pressure and the quantity of water in certain parts of the city seemed to be absolutely nothing, and a constant stream of complaints was lodged with the board of public works on account of no water. It was deemed advisable to make certain tests as to the correctness of these complaints, and to that end pressure gauges were placed in connection with the water system at each of the engine houses. Readings from these gauges were taken every hour, and during the time of greatest demand for water the readings were taken every 30 minutes.

"The average of the readings of the four days is as follows:

Rate per 24 hours.	No. pumps.	No. barrels.	Pressure at			
			Station.	No. 2.	No. 4.	No. 5.
6 p. m. 12.556.560	3	3	60.0	11.5	11.5	24.0
7 p. m. 12.397.040	2	"	"	9.5	5.0	21.0
8 p. m. 13.787.800	2	"	"	10.0	13.0	26.0
9 p. m. 11.862,050	2	"	"	14.0	15.0	36.0

"The variation in pressure due to the difference in the elevation of the different engine houses from the elevation of the pump house would be as follows, all pressures being based on 60 lbs. at the station:

TRUE HYDROSTATIC PRESSURE AND LOSS DUE TO FRICTION.

	Pump station.	Station No. 1.	Station No. 2.	Station No. 3.	Station No. 4.	Station No. 5.
Hydrostatic pressure[1]	60.0	50.2	59.8	52.4	58.9	51.5
On July 16[2]	60.0	44.0	57.0	52.0	57.0	46.0
Loss[3]	0.0	6.2	2.8	.4	2.8	5.5

[1] These figures would be the true hydrostatic pressure, no allowance being made for friction.

[2] Pressure on Sunday, July 16, 4 p. m.

[3] Loss due to friction in mains when probably the minimum amount of water was being used, as it had rained the night before.

COMPARISON OF PRESSURE ON SUNDAY, JULY 16, 1910, WITH AVERAGE PRESSURE FOR FOUR DAYS IN JUNE.

	Pump station.	Station No. 2.	Station No. 4.	Station No. 5.
Sunday, July 16, 1910	60.0	57.0	57.0	46.0
Four days in June	60.0	9.5	5.0	21.0
Difference in pounds	0.0	47.5	52.0	25.0
Per cent	0%	83%	91%	54%

"If these conditions are true, and the figures are the results of one of the investigations made by the present administration in relation to the present water system, then it points squarely to the necessity of a new one, instead of a lean-to here and an addition there to an already cobbled up and entirely deficient system.

"Trautwine, the reference book and authority for all engineers, says: That a 20 inch main will supply 60 gals. of water per day to a population of 33,000. The demands of La Crosse, on a basis of 30,000 people, is and has been for some time past about 100 gals. per day.

"There are two conclusions to be drawn from the foregoing test, viz.: That our system of water mains, especially the laterals, are entirely inadequate for even the present demand, except when operated under the most favorable conditions and with the least demand for water. Secondly: that any number of pumps could be added to the present station and no more water would be delivered to any part of the city, unless a greater domestic pressure than 60 pounds was maintained at the station during the time of even the greatest demand. It is therefore quite evident that some radical and decisive action must be taken in reference to the water system."

For a number of years there has been a conflict of opinions among the citizens of La Crosse upon the question of the source from which the water supply for the city should be drawn. Three views of the matter seem to have been expressed: (1) that the supply should continue to be taken from the Mississippi river; (2) that the supply should be taken from the lagoon in the park; and (3) that a subterranean supply should be developed. The investigation shows that the river water, whether drawn directly from the Mississippi or indirectly from the lagoon in the city park, would require the installation of a filtration plant, as neither source could be relied upon for any permanency in the purity of the water. This is shown by the various analyses of the water taken from the river and the lagoon. As no attempt had ever been made to ascertain definitely whether an adequate and suitable ground supply existed, it became necessary to explore the subterranean waters in the vicinity of La Crosse. In order that a thorough investigation might be made, the Commission requested Professor Charles S. Slichter of the University of Wisconsin to undertake and direct the work of drilling test wells. At the conclusion of the investigation he reported to the Commission the results attained, and his recommendations in the premises. The report bearing date June 14, 1911, is as follows:

"I have made an investigation of the possibility of securing a suitable supply of ground water for a municipal supply for the city of La Crosse, Wis. I report herewith upon such tests as have been made, and make such recommendations as seem pertinent under the instructions received.

LOCATION OF TESTS.

"Six test wells were drilled in the valley of the La Crosse river north of Myrick Park, and not far from the right of way of the Green Bay & Winona R. R. Five of these wells extended across the valley at equal intervals in a straight line. The sixth well was drilled about one-half mile farther up stream.

"In all of these test wells water-bearing sands and gravels were found in stratified beds of various degrees of fineness between depths of 30 and 160 feet below the surface. The first thirty feet consist of fine sand, silt and mud. The best water-bearing material lies about 100 or 120 feet below the surface. The best wells were 140 to 160 feet in depth.

"The test drilling showed such uniform conditions that further test drilling was not deemed necessary. The valley of the La Crosse constitutes a true '*talweg*', filled with sands and gravels in which a true underflow exists.

TEST OF CAPACITY.

"Test pumping designed to show the capacity of the water-bearing sands were carried out in March, 1911. At station No. 1, pumping from a six inch No. 20 Cook strainer 20 ft. in length, placed at a depth of 100–120 feet, gave the results shown in table I. The discharge was measured over an 0.8 trapezoidal weir.

"The average draw-down on the second day of pumping was 7.08 feet. The average discharge on this draw-down was 0.35 second feet, or 157.5 gallons per minute. This corresponds to a specific capacity, or yield for one foot of draw-down, equal to 22.2 G. P. M. The yield for a 20 ft. draw-down would be 445 G. P. M., or almost exactly one cubic foot per second or 600,000 gallons per 24 hours. The capacity of the wells was much greater than anticipated.

TABLE 1.

LOG OF TEST OF WELL NO. 1, AT MYRICK PARK, LA CROSSE, WIS.

Time.	Hook gauge.[1]	Water level in well.[2]	Water level in Copeland well.[3]
March 21, 1911.			
2:30 p. m.	1.432	5.22	(4)
2:32 "	1.660		
2:36 "			3.66
2:37 "		11.2	
2:39 "	1.664		
2:45 "	1.678		
2:53 "	1.675	11.8	
2:54 p. m.[6]			
3:05 p. m.[5]	1.432	5.2	3.49
3:06 "	1.665		
3:08 "		11.2	
3:10 "			3.66
3:12 "		11.4	
3:17 "	1.673	11.6	3.69
3:22 "	1.676	11.7	
3:25 "			3.70
3:28 "		11.6	
3:30 "	1.676	11.65	3.70
3:39 p. m.[7]			
3:49 p. m.[5]		5.23	3.50
3:50 "	1.686	12.0	
4:00 "	1.687	12.3	3.71
4:10 "	1.686	12.1	3.72
4:20 "	1.691	12.4	3.73
4:30 "	1.681	12.0	3.73
4:40 "	1.688	12.2	3.73
4:45 p. m.[8]			
4:51 "			3.53
4:53 p. m.[5]			
4:55 "	1.686	12.2	3.67
5:03 p. m.[9]			
5:25 p. m.[5]			
5:30 "	1.667	11.2	3.68
8:00 "	1.664	11.0	3.71
8:30 "	1.678	11.9	3.74
8:45 "	1.675	11.6	3.74
9:05 "	1.668	11.1	3.73
9:30 "	1.663	11.3	3.74
9:32 p. m.[10]			
March 22, 1911.			
9:40 a. m.[5]			
9:50 "		11.3	
10:00 "	1.677	12.3	3.74
10:30 "	1.679	12.4	3.77
10:45 "	1.675	12.2	3.77
11:10 "	1.659	11.7	3.77
11:20 "	1.680	12.5	3.78
11:35 "	1.664	11.9	3.76
2:40 p. m.	1.677	12.4	3.80
3:15 "	1.672	12.3	3.80
3:30 "	1.670	12.3	3.79
4:00 "	1.660	11.7	3.79
4:05 "	1.670	12.3	3.79
4:15 "	1.676	12.5	3.80
4:30 "	1.677	12.5	3.80
4:45 "	1.673	12.4	3.80
5:00 p. m.[11]	1.660	11.8	3.79
5:05 "			3.60
5:15 "	1.420		3.57

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[1] Trapezoidal weir of length 0.8 ft. was used.

[2] Referred to center of pump inlet—about one foot above ground.

[3] From arbitrary datum. Copeland well 14' from well No. 1.

[4] Below normal, due to boiler supply having just been taken from this well—normal about 3.5 feet.

[5] Pump started.

[6] Pump stopped to replace gland and packing on valve rod.

[7] Stopped to repack valve rod on pump.

[8] Stopped pump to change steam connection on boiler.

[9] Pump out of order and stopped, found to have water piston loose on piston rod.

[10] Pump stopped for the night.

[11] Pump stopped after obtaining these readings.

THE QUALITY OF THE WATER.

"Samples were taken from wells No. 1 and No. 3, each after several hours pumping, for chemical and bacterial examination. The results are given in tables II, III and IV:

TABLE II.

CHEMICAL ANALYSIS OF WATER FROM WELL NO. 1.

	Parts per million.
Total solids at 100° C	361
Silica	trace
Oxides of iron and aluminum	trace
Calcium (Ca)	66.71
Magnesium (Mg)	21.98
Sodium (Na)	13.84
Potassium (K)	5.36
Sulphuric Acid as SO_4	2.47
Carbonic Acid as CO_3	10.2
Carbonic Acid as HCO_3	305.8
Chlorine (Cl)	4.0

TABLE III.

REPORT OF THE CHEMICAL ANALYSIS OF WATER FROM WELL NO. 3.

	Parts per million.
Nitrogen as free ammonia	0.000
Nitrogen as albuminoid ammonia	0.016
Nitrogen as nitrites	0.000
Nitrogen as nitrates	0.00
Chlorine	2.6
Sulphates	.....
Iron	0.00
Oxygen consumed	0.50
Total solids	285
Hardness	272
Alkalinity	250

Odor	0	Water O. K. chemically.
Color	0	
Turbidity	0	

TABLE IV.

REPORT OF THE BACTERIOLOGICAL EXAMINATION OF WATER FROM WELL NO. 3.

No. Bacteria per cc. in gelatin incubated at 22° C	15
No. liquefying bacteria per cc	0
No. species of bacteria per cc	3
No. bacteria per cc. growing at body temperature	1
No. acid producing bacteria per cc	0
Colon bacteria in	
1cc	0
10cc	0

"Bacteriologically the water leaves nothing to be desired. Chemically the water contains principally bicarbonates of lime and magnesium, the total solids dissolved in 1,000,000 lbs. of water from well No. 1 were 361 lbs., and from well No. 3 285 lbs., from Mississippi River water 183 lbs. The ground water is thus softer the nearer one approaches the channel of the La Crosse river. Water from the Mississippi contained about one-third less dissolved solids than water from well No. 3.

TABLE V

CHEMICAL ANALYSIS OF WATER FROM MISSISSIPPI RIVER.

	Parts per million.
Total solids at 100° C	183.0
Silica	trace
Oxides of iron and aluminum	trace
Calcium (Ca)	28.43
Magnesium (Mg)	9.52
Sodium (Na)	14.02
Potassium (K)	4.48
Sulphuric Acid as SO_4	trace
Carbondioxide CO_2 free	5.5
Carbonic acid as HCO_3	148.0
Chlorine (Cl)	8.0

"The water contains no salts of iron, or any deleterious material whatsoever. The hardness is such that nearly all of the incrusting solids would be precipitated in the feed water heater, in case the water is used for steam purposes. The simplest possible boiler compound could be used in the boilers, exactly the same as would be used for the river water, and with identical results.

"The water from well No. 3 is softer than almost any well water used for municipal supply by any Wisconsin city. In table VI I have tabulated all of the analyses of well water used for municipal supply that I could secure. Wausau and Manitowoc are the only cities on the list reporting a softer water. The Wausau water has other features more undesirable than hardness. Manitowoc is an interesting case. The large well used for supply is on the shore of Lake Michigan. Lake Michigan water at Manitowoc contains 171 parts per million of dissolved solids. Instead of using the softer water from the lake, the city supply is taken from wells on the shore whose water is 55 per cent harder. I also include in this table an analysis of White Rock water, Waukesha, and the water from Rockford, Ill. Rockford, Ill., is a manufacturing city of considerable importance, having a population of about 50,000. The water there used is nearly 60 per cent harder than water from the La Crosse test wells.

TABLE VI.

ANALYSES OF CITY WATER SUPPLIES.

TAKEN FROM RECORDS OF WISCONSIN CITIES USING WELL WATER AS SOURCE OF SUPPLY.

LOCATION.	Owner.	Depth feet.	PARTS PER MILLION.												Analyst.
			Ca.	Mg.	Na.	K.	CO_3.	HCO_3	SO_4	Cl.	Fe.	SiO_2.	Al_2O_3	Total.	
N. Fond du Lac..	City.	400	113.46	31.76	31.95	7.60	140.57	....	117.07	98.97	0.13	6.91	0.94	549 41	W. S. Ferris.
Depere, E.........	"	840	62.60	46.98	20.61	16.21	116.15	69.41	104.84	21.67	0.67	7.27	0.92	467.34	W. W. Daniells.
Depere, W.........	"	800	79.80	39.46	12.73	11.22	85.20	165 29	24.10	12.25	0.81	30.71	0.94	457.53	W. W. Daniells.
Darlington.........	"	21	78.69	45.76	4.71	0.75	....	393.06	3.96	4.15	0.53	10.43	11.29	553.36	W. W. Daniells.
Wauwatosa.........	"	1,357	146.66	26.23	9.51	5.45	....	248 52	230.33	8.71	....	8 89	....	684.33	....
River Falls,.......	"	504	28.18	63.62	....	....	69.06	....	126 76	....	Fe. 203 18.13	34.20	53.35	393.30	W. Lehnen.
Oconomowoc... ..	"	824	60.05	33.98	7.49	....	184 03	....	....	9.78	....	....	....	295.32	C. M. & St. P., Chemist.
Monroe............	"	30	98.99	35.45	....	....	229 96	....	9.89	Alk. Cl. 47.37	Alk.SO_4 21.72	....	Oxides 6.84	450.25	C. M. & St. P., Chemist.
Beloit..............	"	100	64.77	28.96	....	....	162 49	....	10.02	Alk. Cl. 7.35	Alk.SO_4 12.48	....	Oxides 1.71	287.79	C. M. & St. P., Chemist.
Columbus.........	"	74	63.95	36.84	4.46	....	186 99	....	8.21	0.83	....	....	0.85	302.15	H. E. Smith.
Burlington........	"	1.008	80 27	25.24	9.07	4.24	....	266 17	47.49	4.77	0.16	6.84	0.51	444 78	E. G. Smith.
Rockford, Ill.....	"	1,500	95.56	60.53	2.39	1.76	291 35	PO_4 0.09	8.39	....	Fe_2O_3 2.56	9.23	1.03	473 50	E. G. Smith.
Wausau...........	"	135	18.00	5.45	....	....	64.26	PO_3 0.25	2.91	Alk. Cl. 3.76	Alk.CO_2 22.91	Alk.SO_4 3.76	14.70	135.76	E. G. Smith.
White Rock* Waukesha.......	....	Spring	63.10	30.80	8.9	K.NO_3 5.8	....	172 8	53.7	38.08	0.1	13.0	1.0	388.0	O. Texter.
Madison...	City.	751	85.47	36.59	8.67	1.81	....	374.91	5.66	3.03	1.13	....	Tr.	517.30	W. W. Daniells.
Manitowoc.........	....	....	....	....	....	....	....	....	....	8.0	0.00	....	....	264.0	Wis. Hy. Lab.
La Crosse.........	Test No. 1.	120	66.71	21.98	13.84	5.36	10.2	305.8	2.47	4.0	Tr.	Tr.	Tr.	361.0	V. Lehner.
La Crosse.........	Test No. 3.	120	....	....	....	....	....	....	....	....	....	....	....	285.0	Wis. Hyg. Lab.
La Crosse.........	River 3—20—11.	....	28.43	9.52	14.02	4.48	5.5	148 0	Tr.	8.0	Tr.	Tr.	Tr.	183.0	V. Lehner.

*Private spring water.

ADVANTAGES OF GROUND WATER SUPPLY.

"The underflow waters of the La Crosse river valley have a number of advantages for a city of the size of La Crosse. Some of them may be stated as follows:

"1. The supply is near at hand and the cost of development will be low, lower than any other source of satisfactory supply for present needs, and much lower than others when the future needs of the city are considered.

"2. The land upon which the wells would be located is vacant and could be secured in large tracts so as to forever protect the purity of the supply.

"3. The present purity and future purity of the supply is beyond question.

"4. The temperature of the water is nearly the same summer and winter, which would result in reduced ice consumption and insure freedom from freezing troubles in winter.

"5. The annual death rate among adults and children would be materially lower under the ground water supply than under any possible system of purified river water. Water of absolutely uniform quality would be available in all parts of the city and all of the days of the year. This uniformity is in itself a very important matter.

FILTERED RIVER WATER.

"It is theoretically possible by proper careful filtration to purify the Mississippi river water at La Crosse so as to be suitable for domestic needs. Cities of a population of several hundred thousand are able to command the services of experts and to enforce such military discipline among their employes that filtration and similar works can be operated with practically no lapse of efficiency. In America, it has been found to be very generally the case that the smaller cities are unable to maintain that discipline and expert supervision that is absolutely essential to the operating of water treating plants. For that reason, water supply engineers of high standing refrain from recommending such plants where a safe supply is available from other sources.

"A very good instance of this occurs in the exhaustive report just submitted by three of our most eminent engineers: John W. Alvord, Dabney H. Maury, and Daniel W. Mead, who constitute a commission to report on the enlargement or reconstruction of the water supply system of Rockford, Ill. This report considers eight possible schemes of supply for the city, two of them involving filtration of river water. The sanitary considerations which prompted them to recommend the extension of the present artesian system as source of supply, they state as follows:

"'It should be fully understood and appreciated that any supply that demands filtration as an adjunct must depend for its purity on constant care and vigilance by experts thoroughly conversant with such operations, and that any carelessness or lack of vigilance will result in a temporary reduction in quality which may, if it occurs at a critical time, result in contamination, with possible resulting sickness and death among its users.

"'The best results with any public work are always secured by concentrated, rather than continuous effort, and a water supply which is normally pure and which must simply be guarded by proper construction in order to insure its constant delivery to the consumer in potable condition, is much to be desired above any supply that demands continuous vigilance as the price of safety.'

RECOMMENDATION.

"I recommend as follows:

"1. That the city of La Crosse purchase at least 80 acres of land, including the forty containing test wells 3 and 4 and the forty east thereof.

"2. That the city of La Crosse at once proceed to develop a municipal supply from the underflow gravels in the valley of the La Crosse river, the wells to be constructed between test wells 3 and 4 or in similar location east thereof.

"3. That at least four batteries of three or four 8″ or 10″ wells each be constructed in the location described, that each battery be pumped by an electrically driven centrifugal pump of about 3 second-feet record capacity and the discharge lead to a suitable receiving well or wells of a capacity of at least one million gallons, and thence connected to high duty pumps for city service.

"4. That no strainers be placed in wells nearer than 100 feet from the surface of the water plane.

"5. That the wells of each battery be 100 ft. apart and that the batteries be placed not closer than 800 ft. from each other.

"6. That the new principal water mains necessary for the new plant be so designated and located that connection with a reservoir on the face of the river bluff may be as practicable and convenient as possible when such construction may be desirable in the future."

The city of La Crosse is blessed as few cities in the land, in that it has at its very threshold an adequate supply of water which in quality surpasses the water of one of the most famous springs in the world. The water is suitable for domestic and manufacturing purposes, and can be acquired without the expenditure of a great amount of money. When it is considered that the growth and prosperity of the city depends perhaps more upon the quality of its water supply than upon any other single factor, there is but one conclusion that can be reached from the investigation made, and that is that the recommendations of Professor Slichter should be accepted and followed without hesitation. Cities are coming to realize more and more the necessity of securing and maintaining a permanent and adequate supply of pure water for municipal and private purposes without the necessity of resorting to the expediency of mechanical filtration, which, under the best conditions attainable, is uncertain at times in its results. Vast sums of money were expended by the city of New York in constructing an aqueduct through which its supply of water is conducted from the Catskill mountains. Los Angeles is at present engaged in the mammoth undertaking of constructing a waterway by which it will receive a pure supply of water from the mountains many miles distant from the city. The city of La Crosse, with the outlay of a very few dollars, will have an adequate supply of water which in permanency of quality and purity is ideal in every respect.

We shall not attempt to specify in the order any details of construction, as that is a matter that should be left to the engineers who will be placed in charge of the reconstruction of the plant and the development of the water supply.

When the plant is reconstructed, meters should be installed throughout the city. The question of meters will be reserved until later, as some further investigation must be made relative to the plan that shall be pursued respecting the matter.

NOW, THEREFORE, IT IS ORDERED: (1) That the city of La Crosse shall take whatever steps may be necessary for securing and maintaining permanently a reasonably adequate supply of wholesome water;

(2) That the said city take whatever steps may be necessary to place its pumps and other machinery and appliances in a proper state of repair and condition, so as to continually maintain sufficient pressure to serve adequately all its consumers, and that it hold itself in readiness at all times to provide adequate pressure for the extinguishment of fires.

Eighteen months is deemed a reasonable time within which to comply with this order.

CURTIS & YALE COMPANY
vs.
CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY, MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY.

Submitted March 14, 1911. Decided June 23, 1911

Petition alleging that the C. L. and L. C. L. rates in effect on respondent's lines on sash and doors from Wausau to "Soo" line stations north of Marshfield to Hurley and west of Abbotsford to the state line are unreasonably high and unjustly discriminatory when compared with similar rates from Oshkosh and Milwaukee to the same points, and that they are higher than rates for hauls of a like distance on one line, plus an adequate charge for transfer and re-billing. It was shown that the rates complained of are higher than similar rates in Iowa and Illinois. A large number of comparisons are made with similar joint rates on various lines in the state. The respondents contended against the proposition that rates over two roads should equal the rates for similar distances over one road, plus a reasonable charge for transfer and re-handling. A compilation of rates complained of is given, which shows that there are many conflicts and inconsistencies in the tariffs. It is shown that L. C. L. through rate and the C. L. rate between Wausau and the points named on the "Soo" line is the same as the local rates between Milwaukee and the same points, with some exceptions, and higher than the Oshkosh rate; that specific joint rates voluntarily put in effect by railroad companies follow closely the specific single line rates for similar distances in the same territory. The present method of respondents of making Milwaukee the basis of the Wausau rates, a point more than three times the distance of Wausau from the points to which rates are made, practically results in making no joint rates from Wausau.

Ordered: That the respondents put in effect on sash, doors and blinds the schedule of rates named herein. The class rates named are slightly higher, but are based largely upon the single line distance rates in effect for like distances and correspond with joint rates voluntarily put in effect by railways. The C. L. rates are one cent higher than C. L. rates on lumber, as fixed by the Commission. A complete schedule of class rates is also given, the adoption of which is recommended to the respondents.

The petitioner, an Iowa corporation manufacturing sash and doors at Wausau, Wis., complains of the class rates and carload rates in effect upon the respondents' lines from Wausau to "Soo" line stations north of Marshfield to Hurley and west of

Abbotsford to the Minnesota line. The petition sets forth that said rates, both carload and less than carload, are higher than rates from Oshkosh to the same points, over a considerably greater distance, and in some cases are higher than the rates from Milwaukee to the same points for three times the distance; that the said rates are considerably greater than the rates for hauls of a like distance on one road, plus an adequate charge for transfer and re-billing at the junction point. The petition, by way of illustration, gives in tabular form the rates, both carload and less than carload, from Wausau, Oshkosh and Milwaukee to three "Soo" line points, showing the Oshkosh rates, on the "Soo" line alone, to be considerably lower than the rates on both lines for the shorter distance from Wausau to the same points, and the rates from Milwaukee to be the same as from Wausau for less than carload freight, but less than the Wausau rate in one case for carload shipments.

Each of the respondent companies filed a separate answer, denying that the rates complained of are, under the circumstances, unreasonably high or unlawfully discriminatory.

The matter was heard at the office of the Commission, March 14, 1911. The petitioner was represented by *W. E. Curtis,* the respondent Chicago, Milwaukee & St. Paul Railway Company by *F. G. Wright,* and the respondent Minneapolis, St. Paul & Sault Ste. Marie Railway Company by *A. H. Bright.*

The petitioner offered testimony showing that the greatest competition which it has to meet comes from Milwaukee, Fond du Lac and Oshkosh, especially the latter city, and that with the present rates to "Soo" line points considerably higher from Wausau than they are for a longer haul from Oshkosh, the petitioner is forced to absorb so large a freight charge as to deprive it of much of the benefit of its location nearer the points of destination. If Wausau and Oshkosh were given equal rates to these points, the situation would be considerably relieved, but the petitioner believes that in view of the much shorter distance from Wausau the rates from that point should be lower than from Oshkosh, and should not exceed the rates for similar distances on one line plus a reasonable charge for transfer and re-handling at junction points. The witness for the petitioner cited rates, applying over two lines, from Dubuque and other Iowa points to points in Illinois, which were less than half as high as the rates from Wausau to the points to which the petitioner ships; while glazed sash, an article largely shipped by the petitioner, is placed in fourth class in Illinois and in third class in Wisconsin. By way of specific illustration, it was testified that the rate on glazed sash at fourth class from Dubuque to Pecatonica, Ill., 101 miles, was 18.1 cts. per 100 lbs., or 1.8 cts. per mile per 1000 lbs., while the rate on glazed sash, third class, from Wausau to Spencer, Wis., 58 miles, was 33 cts. per 100 lbs., or 5.7 cts. per mile per 1000 lbs.

As to industrial conditions at Wausau and at the points with which the petitioner competes, it was testified that the lumber for sash and doors all comes from the Spokane district, with no appreciable difference in freight rates as between Milwaukee, Oshkosh and Wausau; that, as to the glazed sash, Milwaukee has a considerably lower rate on glass than Wausau; that labor costs do not differ much as between Wausau and competing points; and that on single line shipments the petitioner has little difficulty in competing successfully with Oshkosh and Milaukee manufacturers, but where, as in the case of the rates complained of, the shipment is over two lines, the petitioner loses much of the advantages of nearness to the market.

The witness for the petitioner complained, also, of the unfairness of the third class rate for glazed sash in Wisconsin as compared with the fourth class rate in Illinois and Iowa, but admitted that the Wisconsin product does not compete with that in Iowa and Illinois, and that the difference in classification does not, therefore, in itself affect the petitioner unfavorably.

The testimony presented by the respondent companies was to the effect that the railways opposed the proposition that rates over two roads should equal the rates for similar distances on one road plus a reasonable charge for transfer and re-handling. It was asserted that single line rates are no measure for rates over two lines, or at least, if comparable at all, rates over two lines should be equal to rates for much longer distances upon one line, as is true of the rates complained of. It was stated that the respondent railway companies had no published joint rates specifically applying to Wausau for shipments over the two lines to the "Soo" line points involved here, but that such rates were made from Milwaukee, and the rates in force were the Milwaukee rates, made applicable by the publication of an application sheet.

The facts presented at the hearing are hardly sufficient to comprehend the entire situation as to the rates complained of, and as to the basis on which rates over more than one line in northern Wisconsin are and should be made. The Commission has, therefore, as is usual in such cases, made a more or less independent investigation of the situation. It was found necessary, in the first place, to make up a compilation of the rates complained of, that is, the class rates and the carload rates on sash, doors and blinds from Wausau to points on the "Soo" line north of Marshfield to Hurley and west of Abbotsford to the Minnesota line. To these were added the rates from Oshkosh and Milwaukee to the same points, and the single line distance tariff rates for distances equivalent to those from Wausau to the various points.

Table I shows the rates thus found to be in effect.

The first two items in each group, namely, "Sum of locals" and "Joint through" rates, were inserted for comparative purposes. As between these rates, the lower rate is the one that applies in all cases where there is a difference.

In making up table I, it was necessary to use a number of different tariffs, and it was noted that there were many conflicts and inconsistencies among the tariffs. For example, W. C. tariff No. B—2497, effective Nov. 4, 1908, and still in force, names a carload rate of 11 cts. per 100 lbs. on sash, doors and blinds between Wausau and Hurley, and provides that this rate may be used between intermediate points. This has the effect of making 11 cts. the maximum rate between Wausau and the stations on the "Soo" line from Junction City to Hurley. W. C. tariff No. D—192, effective Feb. 25, 1909, and still in force, names a rate of 9 cts. on sash, doors and blinds from Dorchester to Wausau. Therefore, the rate from Wausau to Dorchester is 11 cts. and from Dorchester to Wausau, 9 cts. C. M. & St. P. G. F. D. No. 3704—B, effective Jan. 14, 1911, and still in force, names a specific rate of 13 cts. on sash, doors and blinds from Wausau to Medford, Chelsea, Westboro and Prentice. This 13 ct. rate, however, is of no effect except to complicate matters, as W. C. tariff B—2847 provides an 11 ct. rate between the same points. Many similar inconsistencies, too numerous to be detailed here, are to be found in the tariffs.

TABLE I.

CLASS RATES AND CARLOAD RATES ON SASH, DOORS AND BLINDS,

AT PRESENT IN EFFECT BETWEEN POINTS NAMED ON THE "SOO" LINE AND WAUSAU, OSHKOSH AND MILWAUKEE: ALSO WISCONSIN DISTANCE TARIFF RATES FOR EQUIVALENT DISTANCES.

Points between which rates apply.	Rate.	Miles.	RATES IN CENTS PER 100 LBS.										
			Classes.										Sash, etc., C. L., north-bound.
			1	2	3	4	5	A	B	C	D	E	
Spencer:													
Wausau.......	Sum of locals..	58	45	39	32	24	18	18	12	11	9	8	13
Wausau.......	Joint through..	58	50	42	33	21	16	21	16	14	12	10	[1]11
Oshkosh.......	Local...........	116	42.5	33	26	20.5	16	17	12	9.5	7.5	7	9.5
Milwaukee....	Local...........	200	50	42	33	21	16	21	16	14	12	10	11
	Local dis. rate.	60	31	25.5	21	15	12	12	10	7.5	6	5	9.5
Unity:													
Wausau.......	Sum of locals..	64	49	41	34	25	19.5	19.5	13	12	9.5	8.5	14
Wausau.......	Joint through..	64	52	43.5	34	21	16	21	16	14	12	10	[1]11
Oshkosh.......	Local...........	122	43	33.5	26.5	20.5	16	17.5	12.5	10	8	7	9.5
Milwaukee....	Local...........	206	52	43 5	34	21	16	21	16	14	12	10	11
	Local dis. rate.	65	32	26.5	22	15.5	12.5	12.5	10	7.5	6	5.5	10
Colby:													
Wausau.......	Sum of locals..	68	49	41	34	25	19.5	19.5	13	12	9.5	8.5	14
Wausau.	Joint through..	68	53	44	34	21	16	21	16	14	12	10	[1]11
Oshkosh.......	Local...........	126	43	34	26.5	21	16	18	12.5	10	8	7	9.5
Milwaukee....	Local...........	210	53	44	34	21	16	21	16	14	12	10	11
	Local dis. rate.	70	33	27.5	22.5	16	13	13	10.5	7.5	6	5.5	10.5
Abbotsford:													
Wausau.......	Sum of locals..	71	50.5	42	35	25.5	20	20	14	12.5	10	8.5	14.5
Wausau.......	Joint through..	71	53	44	34	21	16	21	16	14	12	10	[1]11
Oshkosh.......	Local...........	129	43	34	26.5	21	16	18	12.5	10	8	7	9.5
Milwaukee....	Local...........	213	53	44	34	21	16	21	16	14	12	10	11
	Local dis. rate.	75	34	28	23	16.5	13	13	10.5	8	6.5	5.5	11
Dorchester:													
Wausau.......	Sum of locals..	77	51.5	43	35.5	26	20.5	20.5	15	12.5	10	9	15
Wausau.......	Joint through..	77	53	45	35.5	22	17	22	17	14.5	12.5	11	[1]11
Oshkosh.......	Local...........	133	43.5	34.5	27	21.5	17	18	12.5	10	8	7.5	9.5
Milwaukee....	Local...........	217	53	45	35.5	22	17	22	17	14.5	12.5	11	11
	Local dis. rate.	80	35	29	24	17	13.5	13.5	10.5	8	6.5	6	11.5
Stetsonville:													
Wausau.......	Sum of locals..	80	52.5	44	36.5	26.5	20.5	20.5	15.5	12.5	10	9	[2]15.5
Wausau.......	Joint through..	80	55	46.5	36.5	23	18	23	18	15	13	12	11
Oshkosh.......	Local...........	138	44	35	27	22	17.5	18.5	13	10.5	8	7.5	9.5
Milwaukee....	Local...........	222	55	46.5	36.5	23	18	23	18	15	13	12	11
	Local dis. rate.	80	35	29	24	17	13.5	13.5	10.5	8	6.5	6	11.5
Medford:													
Wausau.......	Sum of locals..	84	53 5	45	37	27	21	21	16	13	10.5	9	[3]14.5
Wausau.......	Joint through..	84	55	46.5	36.5	23	18	23	18	15	13	12	11
Oshkosh.......	Local	142	44.5	35.5	27.5	22	17.5	18.5	13	10.5	8.5	7.5	9.5
Milwaukee....	Local	227	55	46.5	36.5	23	18	23	18	15	13	12	11
	Local dis. rate	85	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6	12
Athens:													
Wausau.......	Sum of locals..	86	53.5	45	37	27	21	21	16	13	10.5	9	[3]15.5
Wausau.......	Joint through..	86	53	44	34	21	16	21	16	14	12	10	[4]14.5
Oshkosh.......	Local...........	144	44.5	35.5	27.5	22	17.5	18.5	13	10.5	8.5	7.5	9.5
Milwaukee....	Local...........	229	55	46.5	36.5	23	18	23	18	15	13	12	11
	Local dis. rate	90	36.5	30	24.5	18	14.5	14.5	11	8.5	7	6	12.5

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[1] Carload rate south-bound, 9 cts.
[2] Carload rate south-bound, 15 cts.
[3] Carload rate south-bound ½ ct. higher.
[4] Carload rate south-bound, 11 cts.

TABLE I.—Continued.

Points between which rates apply.	Rate.	Miles.	RATES IN CENTS PER 100 LBS.										
			Classes.										Sash, etc., C. L., north bound.
			1	2	3	4	5	A	B	C	D	E	
Chelsea:													
Wausau.......	Sum of locals..	96	55.5	47	38.5	28	22	22	16.5	13	10.5	9.5	[3]14.5
Wausau.......	Joint through..	96	56	47	37	23	18	23	18	15	13	12	11
Oshkosh.......	Local...........	154	45.5	38.5	28	22.5	18	19.5	13.5	11	8.5	7.5	9.5
Milwaukee....	Local...........	238	56	47	37	23	18	23	18	15	13	12	11
	Local dis. rate	100	38.5	31	25	19	15	15.5	11.5	9	7	6.5	13
Goodrich:													
Wausau.......	Sum of locals..	97	55.5	47	38.5	28	22	22	16.5	13	10.5	9.5	$3.50
Wausau.......	Joint through..	97	60	50	39	25 (	$3.50	car	abo	ve A	then	s)	per car
Oshkosh.......	Local...........	155	45.5	38.5	28	22.5	18	19.5	13.5	11	8.5	7.5	above
Milwaukee....	Local...........	239	55	46.5	36.5	23	18	23	18	15	13	12	Athens
	Local dis. rate	100	38.5	31	25	19	15	15.5	11.5	9	7	6.5	13
Westboro:													
Wausau.......	Sum of locals..	100	56.5	47.5	39	28.5	22	22	16.5	13.5	11	9.5	[3]15
Wausau.......	Joint through..	100	56	47	37	23	18	23	18	15	13	12	11
Oshkosh.......	Local...........	158	46	37	28.5	23	18	20	14	11	8.5	8	10.5
Milwaukee....	Local...........	242	56	47	37	23	18	23	18	15	13	12	11
	Local dis. rate	100	38.5	31	25	19	15	15.5	11.5	9	7	6.5	13
Rib Lake:													
Wausau.......	Sum of locals..	101	60.5	51	41.5	30							
Wausau.......	Joint through..	101	61	51	40	25	C.	L.,	$2.50	per	car	abo	ve
Oshkosh.......	Local...........	159	50.5	40.5	31	24.5				Che	lsea.		
Milwaukee....	Local...........	243	58	49.5	38.5	25							
	Local dis. rate	105	39.5	31.5	25	19	15.5	16	11.5	9	7	6.5	13.5
Ogema:													
Wausau.......	Sum of locals..	106	57.5	48.5	40	29	22.5	22.5	16.5	13.5	11	10	[3]15
Wausau.......	Joint through..	106	56	47	37	23	18	23	18	15	13	12	11
Oshkosh.......	Local	164	46.5	37.5	28.5	23	18	20	14.5	11.5	8.5	8	[5]11
Milwaukee....	Local...........	248	56	47	37	23	18	23	18	15	13	12	12
	Local dis. rate	110	40.5	32	25.5	19.5	15.5	16.5	12	9	7.5	6.5	13.5
Prentice:													
Wausau.......	Sum of locals..	114	59	49.5	40.5	30	23.5	23.5	17	14	11.5	10	[6]15.5
Wausau.......	Joint through..	114	56	47	37	23	18	23	18	15	13	12	11
Oshkosh.......	Local...........	172	47	38.5	29.5	23	18	21	15.5	12.5	9.5	8.5	[7]11
Milwaukee....	Local...........	256	56	47	37	23	18	23	18	15	13	12	12
	Local dis. rate	115	41.5	32.5	26	20	16	17	12	9.5	7.5	7	14
Phillips:													
Wausau.......	Sum of locals..	126	61	50.5	41	31	24	24.5	17.5	14.5	11.5	10.5	15.5
Wausau.......	Joint through..	126	60	50	40	25	19	25	19	16	14	13	11
Oshkosh.......	Local...........	184	48	39.5	30.5	24	19	21.5	16.5	13.5	10.5	9.5	11
Milwaukee....	Local...........	268	60	50	40	25	19	25	19	16	14	13	12
	Local dis. rate.	130	43	34	26.5	21	17	18	12.5	10	8	7	14.5
Fifield:													
Wausau.......	Sum of locals..	139	64	52	42	32	25	26	18	15	12	11	15.5
Wausau.......	Joint through..	139	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	197	50	42	33	24.5	19.5	23	18	15	12	11	11
Milwaukee....	Local...........	281	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	140	44	35	27	22	17.5	18.5	13	10.5	8	7.5	15
Park Falls:													
Wausau.......	Sum of locals..	144	65	52.5	42	32.5	25	26	18	15	12	11	16.5
Wausau.......	Joint through..	144	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	202	52	43.5	34.5	25	20	23.5	18.5	15.5	12.5	11.5	11
Milwaukee....	Local...........	286	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	145	44.5	35.5	27.5	22	17.5	18.5	13	10.5	8.5	7.5	15.5

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[3] Carload rate south-bound, ½ ct. higher.
[5] Carload rate south-bound, ½ ct. lower.
[6] Carload south-bound, 2 cts higher.
[7] Carload rate south-bound, 12.5 cts.

TABLE I.—Continued.

Points between which rates apply.	Rate.	Miles.	RATES IN CENTS PER 100 LBS.										
			Classes.										Sash etc. C. L., north-bound.
			1	2	3	4	5	A	B	C	D	E	
Butternut:													
Wausau.......	Sum of locals..	150	65.5	53	42.5	32.5	25.5	26.5	18.5	15.5	12.5	11	[4]17.5
Wausau... ...	Joint through..	150	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...	208	52	43.5	34.5	25	20	23.5	18.5	15.5	12.5	11.5	11
Milwaukee....	Local...........	292	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	150	45	36	27.5	22.5	18	19	13	10.5	8.5	7.5	15.5
Glidden:													
Wausau.......	Sum of locals..	160	66	54	43	33.5	26	27	18.5	15.5	12.5	11.5	16.5
Wausau.......	Joint through..	160	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	218	53.5	45	35.5	25	20	24	19	16	13	11.5	11
Milwaukee....	Local...........	302	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	160	46	37	28.5	23	18.5	20	14	11	8.5	8	16
Morse:													
Wausau.......	Sum of locals..	166	66.5	54.5	43	34	26.5	27.5	19	16	12.5	11.5	16.5
Wausau.......	Joint through..	166	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	224	55	46.5	36.5	25.5	20	24.5	19.5	16.5	13.5	12	11
Milwaukee....	Local...........	308	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	170	47	38	29	23.5	18.5	20.5	15	12	9	9	16.5
Mellen:													
Wausau.......	Sum of locals..	178	67.5	55.5	43.5	34.5	27	28	19	16	13	11.5	16.5
Wausau.......	Joint through..	178	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	256	56.5	48	37.5	26	20	25.5	20	17	14	12	11
Milwaukee....	Local...........	320	61	52	41	26	20	26	20	17	16	14.5	12
	Local dis. rate.	180	47.5	39	30	23.5	19	21	16	13	10	9	17
Upson:													
Wausau.......	Sum of locals..	191	69	57	44.5	35	27.5	29	20.5	17	13	12	17.5
Wausau.......	Joint through..	191	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh... ...	Local...........	249	58	49.5	38.5	26	20	26	20	17	14.5	12.5	11
Milwaukee....	Local...........	333	61	52	41	26	20	26	20	17	16	14.5	13
	Local dis. rate.	195	49	41	32	24.5	19.5	22.5	17.5	14.5	11.5	10.5	18
Iron Belt:													
Wausau.......	Sum of locals..	196	69.5	57.5	45	35.5	27.5	29.5	21	17.5	13.5	12	17.5
Wausau.......	Joint through..	196	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	254	60	51	40	26	20	26	20	17	15	13	11
Milwaukee....	Local...........	338	61	52	41	26	20	26	20	17	16	14.5	13
	Local dis. rate.	200	50	42	33	24.5	19.5	23	18	15	12	11	18
Hurley:													
Wausau......	Sum of locals..	204	70	58.5	46	35.5	28	30	22	18.5	14.5	13	17.5
Wausau.......	Joint through..	204	61	52	41	26	20	26	20	17	16	14.5	11
Oshkosh.......	Local...........	262	61	52	41	26	20	26	20	17	15.5	13.5	11
Milwaukee....	Local...........	346	61	52	41	26	20	26	20	17	16	14.5	13
	Local dis. rate.	210	52	43.5	34.5	25	20	23.5	18.5	15.5	12.5	11.5	18.5
Curtiss:													
Wausau.......	Sum of locals..	76	51.5	43	35.5	26	20.5	20.5	15	12.5	10	9	15
Wausau.......	Joint through..	76	53.5	45	35.5	23	18	23	17	15	13	11	11
Oshkosh	Local...........	134	43.5	34.5	27	21.5	17	18	12.5	10	8	7.5	[5]10
Milwaukee....	Local...........	218	53.5	45	35.5	23	18	23	17	15	13	11	11
	Local dis. rate.	80	35	29	24	17	13.5	13.5	10.5	8	6.5	6	11.5
Owen:													
Wausau.......	Sum of locals..	76	51.5	43	35.5	26	20.5	20.5	15	12.5	10	9	15
Wausau... ...	Joint through..	76	54.5	46	36	23.5	18.5	23.5	17.5	15.5	13.5	12	[6]11
Oshkosh	Local...........	134	43.5	34.5	27	21.5	17	18	12.5	10	8	7.5	10
Milwaukee....	Local...........	218	54.5	46	36	23.5	18.5	23.5	17.5	15.5	13.5	12	11
	Local dis. rate.	80	35	29	24	17	13.5	13.5	10.5	8	6.5	6	11.5

[4] Carload south bound, ½ cent lower.
[5] Carload rate south-bound, 16.5 cts.
[6] Carload south bound, 1 cent lower.

TABLE I.—Continued.

Points between which rates apply.	Rate.	Miles.	RATES IN CENTS PER 100 LBS.										
			Classes.										Sash, etc. C. L. north-bound.
			1	2	3	4	5	A	B	C	D	E	
Withee:													
Wausau.......	Sum of locals..	78	51.5	43	35.5	26	20.5	20.5	15	12.5	10	9	15
Wausau.......	Joint through..	78	55	46.5	36.5	24	19	24	18	16	13.5	12	11
Oshkosh	Local...........	136	44	35	27	22	17.5	18.5	13	10.5	8	7.5	10
Milwaukee....	Local...........	220	55	46.5	36.5	24	19	24	18	16	13.5	12	11
	Local dis. rate.	80	35	29	24	17	13.5	13.5	10.5	8	6.5	6	11.5
Thorpe:													
Wausau.......	Sum of locals..	88	53.5	45	37	27	21	21	16	13	10.5	9	15.5
Wausau.......	Joint through..	88	56.5	48	37.5	25	20	25	20	17	14	12	11
Oshkosh	Local...........	146	45	36	27.5	22.5	18	19	13	10.5	8.5	7.5	10
Milwaukee....	Local...........	230	56.5	48	37.5	25	20	25	20	17	14	12	11
	Local dis. rate.	90	36.5	30	24.5	18	14.5	14.5	11	8.5	7	6	12.5
Stanley:													
Wausau.......	Sum of locals..	95	55.5	47	38.5	28	22	22	16.5	13	10.5	9.5	15.5
Wausau.......	Joint through..	95	58	49.5	38.5	25	20	25	20	17	14	12.5	11
Oshkosh	Local...........	153	45.5	36.5	28	22.5	18	19.5	13.5	11	8.5	7.5	10
Milwaukee....	Local...........	237	58	49.5	38.5	25	20	25	20	17	14	12.5	11
	Local dis. rate.	100	38.5	31	25	19	15	15.5	11.5	9	7	6.5	13
Boyd:													
Wausau.......	Sum of locals ..	100	56.5	47.5	39	28.5	22	22	16.5	13.5	11	9.5	[10]15.5
Wausau.......	Joint through..	100	58	49.5	38.5	25	20	25	20	17	14	12.5	11
Oshkosh.......	Local...........	158	46	37	28.5	23	18.5	20	14	11	8.5	8	[3]10.5
Milwaukee....	Local...........	242	58	49.5	38.5	25	20	25	20	17	14	12.5	11
	Local dis. rate.	100	38.5	31	25	19	15	15.5	11.5	9	7	6.5	13
Cadott:													
Wausau.......	Sum of locals..	106	57.5	48.5	40	29	22.5	22.5	16.5	13.5	11	10	[10]15.5
Wausau.......	Joint through..	106	60	50	40	25	20	25	20	17	14	13	11
Oshkosh	Local...........	164	46.5	37.5	28.5	23	18.5	20	14.5	11.5	8.5	8	[3]10.5
Milwaukee....	Local...........	248	60	50	40	25	20	25	20	17	14	13	11
	Local dis. rate.	110	40.5	32	25.5	19.5	15.5	16.5	12	9	7.5	6.5	13.5
Albertville:													
Wausau.......	Sum of locals..	130	62	51	41	31	24.5	25	17.5	14.5	11.5	10.5	[6]15.5
Wausau.......	Joint through..	130	60	50	40	25	20	25	20	17	14	13	[9]12
Oshkosh	Local...........	188	48.5	40	31	24	19.5	22	17	14	11	10	[9]12
Milwaukee....	Local...........	272	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate	130	43	34	28.5	21	17	18	12.5	10	8	7	14.5
Colfax:													
Wausau.......	Sum of locals..	139	64	52	42.	32	25	26	18	15	12	11	15.5
Wausau.......	Joint through..	139	60	50	40	25	20	25	20	17	14	13	[9]12
Oshkosh	Local...........	197	50	42	33	24.5	19.5	23	18	15	12	11	[9]12
Milwaukee....	Local...........	280	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	140	44	35	27	22	17.5	18.5	13	10.5	8	7.5	15
Wheeler:													
Wausau.......	Sum of locals..	150	65.5	53	42.5	32.5	25.5	26.5	18.5	15.5	12.5	11	[6]15.5
Wausau.......	Joint through.	150	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	208	52	43.5	34.5	25	20	23.5	18.5	15.5	12.5	11.5	[9]12
Milwaukee....	Local...........	291	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	150	45	36	27.5	22.5	18	19	13	10.5	8.5	7.5	15.5
Boyceville:													
Wausau.......	Sum of locals..	156	65.5	53.5	42.5	33	26	27	18.5	15.5	12.5	11	[6]15.5
Wausau.......	Joint through.	156	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	214	53.5	45	35.5	25	20	24	19	16	13	11.5	[9]12
Milwaukee....	Local...........	298	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	160	46	37	28.5	23	18.5	20	14	11	8.5	8	16

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[3] Carload south bound, ½ cent higher.

[6] Carload south bound, 2 cents higher.

[9] Carload south-bound, 1 cent lower.

[10] Carload south bound, 1 cent higher.

[11] Carload south-bound, 2 cents lower.

TABLE I. (Concluded.)

Points between which rates apply.	Rate.	Miles.	RATES IN CENTS PER 100 LBS.										
			Classes.										Sash, etc., C. L., north bound.
			1	2	3	4	5	A	B	C	D	E	
Downing:													
Wausau.......	Sum of locals..	161	66	54	43	33.5	26	27	18.5	15.5	12.5	11.5	[6]15.5
Wausau.......	Joint through.	161	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	219	53.5	45	35.5	25	20	24	19	16	13	11.5	[9]12
Milwaukee....	Local...........	303	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	165	46.5	37.5	28.5	23	18.5	20	14.5	11.5	8.5	8	16.5
Glenwood:													
Wausau.......	Sum of locals..	163	66	54	43	33.5	26	27	18.5	15.5	12.5	11.5	[6]15.5
Wausau.......	Joint through.	163	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	221	55	46.5	36.5	25	20	24.5	19.5	16.5	13.5	12	[9]12
Milwaukee....	Local...........	3 5	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	165	46.5	37.5	28.5	23	18.5	20	14.5	11.5	8.5	8	16.5
Emerald:													
Wausau.......	Sum of locals..	169	67	55	43.5	34	26.5	27.5	19	16	13	11.5	[6]15.5
Wausau.......	Joint through.	169	60	50	40	25	20	25	20	17	14	13	[11]12
Oshkosh.......	Local...........	227	55	46.5	36.5	25	20	24.	19.5	16.5	13.5	12	[9]12
Milwaukee....	Local...........	311	60	50	40	25	20	25	20	17	14	13	[9]12
	Local dis. rate.	170	47	38	29	23.5	18.5	20.5	15	12	9	8	16.5
Cylon:													
Wausau.......	Sum of locals..	175	67.5	55.5	43.5	34.5	27	28	19	16	13	11.5	[6]15.5
Wausau.......	Joint through.	175	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	233	58.5	48	37.5	25	20	25	20	17	14	12	[11]13
Milwaukee....	Local...........	317	60	50	40	25	20	25	20	17	14	13	[11]13
	Local dis. rate.	175	47	38.5	29.5	23.5	19	21	15.5	12.5	9.5	8.5	17
Jewett:													
Wausau.......	Sum of locals..	179	68	56	44	34.5	27	28.5	19.5	16.5	13	11.5	[6]15.5
Wausau.......	Joint through.	179	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	237	58.5	48	37.5	25	20	25	20	17	14	12	[11]13
Milwaukee....	Local...........	321	60	50	40	25	20	25	20	17	14	13	[11]13
	Local dis. rate.	180	47.5	39	30	23.5	19	21	16	13	10	9	17
New Richmond:													
Wausau.......	Sum of locals..	184	68.5	56.5	44.5	35	27.5	29	20	16.5	13	12	[6]15.5
Wausau.......	Joint through.	184	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	242	58	49.5	38.5	25	20	25	20	17	14	12.5	[11]13
Milwaukee....	Local...........	326	60	50	40	25	20	25	20	17	14	13	[11]13
	Local dis. rate.	185	48	39.5	30.5	24	19	21.5	16.5	13.5	10.5	9.5	17.5
Somerset:													
Wausau.......	Sum of locals..	197	69.5	57.5	45	35.5	27.5	29.5	21	17.5	13.5	12	[6]15.5
Wausau.......	Joint through.	197	60	50	40	25	20	25	20	17	14	13	[11]13
Oshkosh.......	Local...........	255	60	50	40	25	20	25	20	17	14	13	[11]13
Milwaukee....	Local	339	60	50	40	25	20	25	20	17	14	13	[11]13
	Local dis. rate.	200	50	42	33	24.5	19.5	23	18	15	12	11	18

[6] Carload south-bound. 2 cents higher.
[9] Carload southbound, 1 cent lower.
[11] Carload south-bound, 2 cents lower.

Table I shows that in practically all cases the less than carload through rate between Wausau and the points named on the "Soo" line is the same as the local rate between Milwaukee and the same points, except where the sum of the local rates makes a lower through rate; and the Wausau rates are in practically all cases higher than the less than carload rates between

Oshkosh and the same points. The carload rates on sash, doors and blinds between the same points vary somewhat from this relationship, but in general the Wausau rate is the same as that from Milwaukee and higher than the Oshkosh rate. Oshkosh, as is shown in the table, is 58 miles, and Milwaukee is 142 miles farther from the "Soo" line points than Wausau. The local distance rates shown in the table are the rates which, in the absence of lower special rates, would apply over a single line between points in Wisconsin at the various distances named. Those shown for carload shipments of sash, doors and blinds are not often used, since in most cases there are other tariff rates that are lower. The local class rates between Oshkosh and the points named are distance tariff rates, except where the rates between Milwaukee and the same points are lower, in which cases the Milwaukee rates apply at Oshkosh.

Although the testimony on the part of the respondent companies indicates that the Wausau less than carload rates to the "Soo" line points consist of the Milwaukee rates applied from Wausau, C. M. & St. P. G. F. D. No. 10000—A, now in force, applies as the Wausau rate the rate from Wauwatosa to the "Soo" line points. In general, the Wauwatosa rates are the same as the Milwaukee rates, but the Wauwatosa rates are joint through rates, while the Milwaukee rates are single line rates, Milwaukee being on the "Soo" line while Wauwatosa is not. Furthermore, this tariff provides for the application of the Wauwatosa-Soo line rates at many other C. M. & St. P. points in the vicinity of Wauwatosa, more and less distant than Milwaukee and Wauwatosa from the "Soo" line points.

The same C. M. & St. P. tariff which makes the Wauwatosa rates apply from Wausau to the "Soo" line points, names specific joint through rates for less than carload shipments between Racine, La Crosse, Winona, Dubuque and Rock Island, and all points on the Chicago division of the "Soo" line, formerly the Wisconsin Central Railway, and provides for the application of these rates at many other points on the Chicago, Milwaukee & St. Paul line, more or less distant from the "Soo" line points than are the specific basing points named. It would be impracticable, for present purposes, to make a compilation of all these joint rates between the Chicago, Milwaukee & St. Paul and the "Soo" lines, but a few have been selected to indicate the general trend of the rates for distances comparable to those from Wausau to the various "Soo" line points involved in this proceeding. To this compilation has been added, wherever it was obtainable from other tariffs, the joint through rate on sash, doors and blinds in carloads between the same points. These rates are shown in table II:

TABLE II.

JOINT RATES IN EFFECT BETWEEN C. M. & ST. P. AND SOO LINE POINTS.

Points between which rates apply.	Miles.	RATES IN CENTS PER 100 LBS.										
		Classes.										Sash & c. C. L. south-bound.[1]
		1	2	3	4	5	A	B	C	D	E	
Wauwatosa:	Via Waukesha											
Lomira........	60	30	24.5	20	14.5	11.5	11.5	8.5	7	5.5	5	....
Byron.	65	30	25	21	15	12	12	8.5	7.5	6	5	....
Hamilton	68	32	26.5	22	15.5	12.5	12.5	10	7.5	6	5.5	....
Van Dyne.....	82	34	28	22.5	16	12.5	13	10.5	8	6.5	5.5	....
Potter.........	125	35	30	24	16	12.5	14	12	9.5	7.5	6	....
Manitowoc....	148	35	30	24	16	12.5	14	12	9.5	8	6	....
Medina Jct....	113	35	30	24	16	12.5	14	11.5	9	7	6	....
Fremont.......	125	35	30	24	16	12.5	14	12	9.5	7.5	6	11
Gill's Landing	128	42	33	26	20	14	17	12	9.5	7.5	7	11
Weyauwega...	131	43	33.5	26.5	20	14	17.5	12.5	10	8	7	11
Waupaca......	138	43.5	34.5	27	20	14	18	12.5	10	8	7.5	11
Sheridan......	145	44	35	27	20	14	18.5	13	10.5	8	7.5	11
Amherst	151	44.5	35.5	27.5	21	16	18.5	13	10.5	8.5	7.5	11
Stevens Point.	167	45.5	36.5	28	21	16	19.5	13.5	11	8.5	7.5	11
Milladore.....	182	46	37	28.5	21	16	20	14	11	8.5	8	11
Marshfield....	199	46	37	28.5	21	16	20	14	11	8.5	8	11
Racine:												
Vernon........	58	30	25	20	15	8	10	7	6	5	4	....
Colgate	65	35	28	23	18	12.5	12	9	8	7	6	....
Cedar Lake...	78	36	29	24	19	13	15	11	10	9	7	9.5
Allenton... ..	83	36	29	24	19	13	15	11	10	9	7	9.5
Theresa.......	92	37	30	26	20	13.5	16	12	10	9	7	9.5
Lomira........	97	39	32	28	20	13.5	17	13	11	9	7	9.5
Byron.........	101	39	32	28	20	14	17	13	11	10	8	9.5
Hamilton......	104	40	32	28	20	14	17.5	13.5	11.5	10	8	9.5
Vandyne......	118	43	36	29	20	15	17.5	15	12.5	10	8	9.5
Medina Jct....	149	43	38	29	20	15	17.5	15	12.5	10	8	9.5
Fremont.......	161	43	36	29	20	15	17.5	15	12.5	10	8	10
Gill's Landing	164	50	42	33	23	18	23	18	15	12	11	11
Stevens Point.	203	50	42	33	23	18	23	18	15	12	11	11
La Crosse:	Via Portage.											
Endeavor.....	117	50	42	33	23	18	23	18	15	12	11	11.5
Bancroft......	160	50	42	33	23	18	23	18	15	12	11	11.5
Plover	171	46	37	28.5	21	17	17.5	14	11	8.5	8	11.5
La Crosse:	Via Jct. City.											
Milladore.....	107	46	37	28.5	21	16	20	14	11	8.5	8	11.5
Marshfield....	124	46	37	28.5	21	16	20	14	11	8.5	8	11.5
Spencer	133	50	42	33	21	16	21	16	14	12	10	12
Unity..........	139	52	43.5	34	21	16	21	16	14	12	10	12
Abbotsford ...	146	53	44	34	21	16	21	16	14	12	10	12
Dorchester....	150	53.5	45	35.	22	17	22	17	14.5	12.5	11	12
Medford	160	55	46.5	36.5	23	18	23	18	15	13	12	12
Prentice.......	189	56	47	37	23	18	23	18	15	13	12	12

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[1] No joint carload rates in effect north-bound.

A comparison of rates given in table II, with local single line rates for similar distances between points in the same territory to which these rates apply, shows that in a general way the joint rates follow closely the single line rates. The La Crosse rates are somewhat higher than the Wauwatosa and Racine rates. This difference exists also in the case of the local rates between La Crosse and points north, when compared with the Wauwatosa and Racine rates for similar distances. In general, specific rates between points in the eastern and southeastern parts of the state, particularly class rates, are somewhat lower than rates between points in the western and northern parts of the state for similar distances. There are, no doubt, reasons for these differences, but in the present case it has not been considered necessary to examine fully into these reasons.

To show further the way in which joint rates are voluntarily put into effect by railroads in this state, table III has been compiled, consisting of a number of joint rates in effect between the Chicago & North Western and the Chicago, Milwaukee & St. Paul railways in Wisconsin. The points to which these rates apply have been selected at random, except that such distances were taken as would facilitate comparison with the rates involved in this case.

The joint rates shown in table III between the Chicago, Milwaukee & St. Paul and Chicago & North Western railways are practically on the single line basis. As a matter of fact, tariffs on file with the Commission indicate that, in a general way, all specific joint rates voluntarily put in force by the railroads in this state follow more or less closely the specific single line rates for similar distances in the same territory. Tables II and III, illustrating this condition, show the general tendency about as well as a complete compilation of specific joint rates between all points in the state would show it.

TABLE III.

JOINT RATES IN EFFECT UPON THE C. & N. W., AND C. M. & ST. P. RAILWAYS.

Between C. M. & St. P. stations.	And C. & N. W. stations.	Miles.[1]	CLASS RATES IN CENTS PER 100 LBS.									
			1	2	3	4	5	A	B	C	D	E
Mayville......	Oakfield	29	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Mayville......	Van Dyne ...	29	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Columbus.....	Jefferson.....	34	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Stoughton	Evansville...	38	36	30	24.5	17.5	14	15	11.5	8.5	7	6
Columbus.....	Oakfield......	45	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Stoughton	Jefferson.....	48	29.3	24.1	18	14.3	10	10	9	7	5.5	5
Stoughton	Baraboo......	52	42.5	33	26	20	14	17	12	9.5	7.5	7
Mayville......	Kaukauna...	165	35	30	24	16	12.5	14	11.5	9	7	6
Grafton......	Oakfield......	68	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Grafton.......	Van Dyne....	68	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Mayville......	New London.	70	35	30	24	16	12.5	14	12	9.5	7.5	6
Mayville......	Wrightstown	71	35	30	24	16	12.5	14	12	9.5	7.5	6
Grafton.......	Kaukauna...	75	35	30	24	16	12.5	14	11.5	9	7	6
Columbus.....	Evansville...	75	36	30	24.5	17.5	14	15	11.5	8.5	7	6
Columbus. ...	Van Dyne....	75	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Grafton.......	Jefferson.....	76	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Mayville......	Jefferson.....	81	35	29.5	24	16	12.5	14	11	8.5	6.5	6
Mayville......	Clintonville..	86	40	33	25	20	14	17.5	12.5	10	8	7
Grafton.......	Wrightstown	94	35	30	24	16	12.5	14	12	9.5	7.5	6
Stoughton	Oakfield......	98	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6
Columbus.....	Baraboo......	101	42.5	33	26	20	14	17	12	9.5	7.5	7
Grafton.......	New London.	102	35	30	24	16	12.5	14	12	9.5	7.5	6
Mayville......	Shawano.....	101	40	33	25	20	15	17.5	13.5	10.5	8.5	7.5
Columbus.....	Kaukauna...	110	35	30	24	16	12.5	14	11.5	9	7	6
Mayville......	Pensaukee...	111	37	32	24	20	14	16	13	10.5	8	7.5
Stoughton	Van Dyne ...	113	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6
Grafton.......	Pensaukee...	112	37	32	24	20	14	16	13	10.5	8	7.5
Mayville......	Baraboo......	115	42.5	33	26	20	14	17	12	9.5	7.5	7
Columbus.....	New London.	116	35	30	24	16	12.5	14	12	9.5	7.5	6
Columbus.....	Wrightstown	116	35	30	24	16	12.5	14	12	9.5	7.5	6
Mayville......	Eland Jct....	117	46	37	28.5	21	16	20	14	11	8.5	8
Grafton.......	Evansville...	118	43	36	29	20	15	17.5	15	12.5	10	8
Grafton.......	Clintonville..	118	40	33	25	20	14	17.5	12.5	10	8	7
Mayville......	Evansville...	123	36	30	24.5	17.5	14	15	11.5	8.5	7	6
Grafton.......	Shawano.....	126	40	33	25	20	15	17.5	13.5	10.5	8.5	7.5
Columbus.....	Clintonville..	132	40	33	25	20	14	17.5	12.5	10	8	7
Mayville......	Antigo.........	137	47.5	39	30	22	16	21	16	13	10	9
Grafton	Baraboo	143	42.5	33	26	20	14	17	12	9.5	7.5	7
Columbus.....	Shawano.....	147	40	33	25	20	15	17.5	13.5	10.5	8.5	7.5
Stoughton	Kaukauna...	149	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6
Grafton.......	Eland Jct....	149	46	37	28.5	21	16	20	14	11	8.5	8
Stoughton	New London.	154	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6
Stoughton	Wrightstown	155	35.5	29.5	24	17.5	14	14	11	8.5	6.5	6
Columbus.....	Pensaukee...	156	37	32	24	20	14	16	13	10.5	8	7.5
Columbus.....	Eland Jct....	163	46	37	28.5	21	16	20	14	11	8.5	8
Grafton.......	Antigo.	169	47.5	39	30	22	16	21	16	13	10	9
Mayville......	Monico Jct...	170	53.5	45	35.5	23	18	23	18	15	13	11.5
Stoughton	Clintonville .	170	40	33	25	20	14	17.5	12.5	10	8	7
Columbus.....	Antigo.......	183	47.5	39	30	22	16	21	16	13	10	9
Stoughton	Shawano.....	185	40	33	25	20	15	17.5	13	10.5	8	7.5
Stoughton	Pensaukee...	195	37	32	24	20	14	16	13	10.5	8	7.5
Stoughton	Eland Jct....	201	46	37	28.5	21	16	20	14	11	8.5	8
Grafton.......	Monico Jct...	202	53.5	45	35.5	23	18	23	18	15	13	11.5
Columbus.....	Monico Jct...	216	53.5	45	35.5	23	18	23	18	15	13	11.5
Stoughton	Antigo, ...	221	47.5	39	30	22	16	21	16	13	10	9
Stoughton	Monico Jct...	254	53.5	45	35.5	23	18	23	18	15	13	11.5

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[1] Distances given are for traffic originating on C. M. & St. P. Ry. Distances for traffic originating on C. & N. W. Ry. differ in some cases from those given above, due to use of different junction points.

The compilations already presented indicate so fully the basis on which joint rates are voluntarily made by the railway companies in this state, that it is not considered necessary to examine closely into the Illinois and Iowa rates, mentioned at the hearing, as a basis of comparison. Rates in Illinois and Iowa, both state and interstate, are very largely upon a distance basis with few variations from the western classification. In Wisconsin, on the other hand, on intra-state traffic, there are innumerable exceptions to the western classification and distance tariff, resulting in many rates lower than those prescribed by the Wisconsin distance tariff. A comprehensive comparison of the Wisconsin rates with those in Illinois and Iowa would, therefore, be a large task, and nothing less than such a comparison could serve any useful purpose in this case. In view of the facts already presented as to joint rates in Wisconsin, such a comparison is considered unnecessary here.

There seems to be no reason why specific joint rates between Wausau and the "Soo" line points comprehended in the petition should not be established, and there seems to be no reason why the basis for such joint rates should vary greatly from the basis used in making similar joint rates between other points in the state.

The present method, of taking as the basis for the Wausau rate a city more than three times the distance of Wausau from the points to which the rates are made, practically results in making no joint rates at all from Wausau. That there is a demand for joint rates between Wausau and these "Soo" line points, is evidenced not only by this formal petition, but by a number of informal complaints which the Commission has received from other parties against the rates involved in this case.

As to less than carload shipments of sash, doors and blinds, it would seem that the regular class rates, as governed by the western classification, should prevail. Under this classification sash, doors and blinds take third class rates. As to carload shipments, these commodities are classed as fifth class in the western classification, but exceptions to the classifications usually provide for them a rate one cent higher than the lumber rate.

After due consideration of the facts above set forth of the local and interstate rate situation as it may be affected by changes in the rates under investigation, and of the cost to the respondent railway companies of performing the services involved in this complaint, the Commission has prepared a schedule of joint rates to take the place of those complained of. The rates thus determined upon are so adjusted as to meet fully the expense of the service, according to cost data heretofore worked out by the Commission. While the complaint and the testimony in this case seem to cover class rates generally, as well as the rates on sash, doors and blinds, it is deemed best to cover only sash and doors in the order herein. Because of the fact, however, that class rates generally appear to be included in these proceedings and because of the further fact that these class rates appear to be higher than they should be and have been the subject of several informal complaints to the Commission on the ground that they were unreasonably high, it is recommended that the full schedule given below in table V be put into effect between Wausau on the one hand and the points named on the other. It will be noted that the less than carload rates on sash, doors and blinds as given in table IV are the same as class 3 rates in table V.

The class rates named below are based largely upon the single line distance rates in effect for like distances, but are in most cases somewhat higher than single line rates, the difference being greater for the higher than for the lower classes of freight. These rates are so made up as to correspond, in a general way, in method with the joint rate schedules shown in tables II and III, voluntarily put into effect by railway companies in this state, with such modifications as prevailing conditions in the territory involved here would seem to make desirable. In some instances, in the case of the rates between Wausau and stations west of Abbotsford on the "Soo" line, it was believed to be advisable to make no changes, in order to avoid conflicts with certain other rates. The instances of this kind do not, however, impair the general adjustment followed throughout the table.

The carload rates which the respondents will be ordered to put into effect are based upon the joint rates made effective by the order of the Commission on the lines of the Chicago & North Western and Chicago, Milwaukee & St. Paul railways, in *Wisconsin Retail Lbr. Dealers' Ass'n v. C. & N. W. R. Co. et al.* 3 W. R. C. R. 471, 482—483. In conformity with the usual practice of the railway companies in fixing carload rates on sash, doors and blinds, the carload rate upon these commodities is placed one cent higher than the carload rate on lumber as fixed by the Commission in the case above mentioned. These carload rates appear to conform satisfactorily to the conditions prevailing in the region under consideration, and to be sufficiently high to assure the respondent companies a just compensation for the services rendered.

Table IV shows the rates on sash, doors and blinds, carload and less than carload, which will be ordered to be substituted for those now in effect:

TABLE IV.

RATES ON SASH, DOORS AND BLINDS.

BETWEEN WAUSAU AND "SOO" POINTS NAMED, AS PRESCRIBED BY COMMISSION.

Station.	Miles	Cents per 100 lbs.		Station.	Miles	Cents per 100 lbs.	
		C. L.	L. C. L.			C. L.	L. C. L.
North of Marshfield.				*West of Abbottsford.*			
Spencer	58	7.7	24.5	Curtis	78	8.1	26
Unity	64	7.8	25.5	Owen	76	8.1	26
Colby	68	7.9	25.5	Withee	78	8.1	26
Abbotsford	71	8	25.5	Thorpe	88	8.3	26.5
Athens	86	8.3	27.5	Stanley	95	8.4	26.5
Goodrich	97	...(1)..	28	Boyd	100	8.5	27
Dorchester	77	8.1	26	Cadott	106	8.7	27.5
Stetsonville	80	8.1	26	Albertville	130	9.1	30.5
Medford	84	8.2	26	Colfax	139	9.3	32.5
Chelsea	96	8.5	27	Wheeler	150	9.5	33.5
Rib Lake	101	...(2)..	30	Boyceville	156	9.7	34.5
Westboro	100	8.5	27	Downing	161	9.9	34.5
Ogema	106	8.7	27.5	Glenwood	163	9.9	34.5
Prentice	114	8.9	28.5	Emerald	169	9.9	34.5
Phillips	126	9.1	30.5	Cylon	175	10.1	35
Fifield	139	9.3	32.5	Jewett	179	10.1	35
Park Falls	144	9.5	33	New Richmond	184	10.3	35.5
Butternut	150	9.5	33.5	Somerset	197	10.5	36.5
Glidden	160	9.7	34.5				
Morse	166	9.9	34.5				
Mellen	178	10.1	35.5				
Upson	191	10.5	36.5				
Iron Belt	196	10.5	36.5				
Hurley	204	10.7	37.5				

[1] $3.50 per car above Athens.
[2] $2.50 per car above Chelsea.

The following complete schedule of class rates, made upon the same general basis as the rates given above, is recommended for adoption by the respondents in this case:

TABLE V.

JOINT CLASS RATES.

BETWEEN WAUSAU AND "SOO" LINE POINTS NAMED, AS RECOMMENDED BY COMMISSION.

Stations on M. St. P. & S. S. M. Railway.	Miles.	CLASS RATES IN CENTS PER 100 LBS.									
		1	2	3	4	5	A	B	C	D	E
North of Marshfield:											
Spencer	58	38	29	24.5	19	15	16	10	9	7.5	6.5
Unity	64	39	30	25.5	20	15.5	16.5	11	9.5	8	7
Colby	68	39	30	25.5	20	15.5	16.5	11.5	9.5	8	7
Abbotsford	71	39	31	25.5	20	15.5	16.5	11.5	9.5	8	7
Athens	86	41	33	27.5	22	17.5	18.5	13.5	10.5	9	8
Goodrich	97	42	33.5	28	22	$3.50	per	car	abov	e Ath	ens.
Dorchester	77	40	32	26	21	16.5	17	12.5	10	8	7
Stetsonville	80	40	32	26	21	16.5	17	12.5	10	8	7
Medford	84	41	33	26	21	16.5	17	12.5	10	8	7
Chelsea	96	43	34	27	22	17.5	18.5	13	10.5	8.5	7.5
Rib Lake	101	48	38	30	24	$2.50	per	car	abov	e Ch	elsea.
Westboro	100	43	34	27	22	17.5	18.5	13	10.5	8.5	7.5
Ogema	106	44	35	27.5	22	18	19	13.5	11	9	8
Prentice	114	46	37	28.5	22.5	18	19	13.5	11	9	8
Phillips	126	48	39	30.5	23	18.5	20	14	11.5	9	8
Fifield	139	50	41	32.5	24	19.5	21	14.5	12	9.5	8.5
Park Falls	144	50.5	41.5	33	24.5	20	21	15	12	9.5	8.5
Butternut	150	51	42	33.5	25	20	21	16	13	10	9
Glidden	160	52	43	34.5	26	20	21.5	16.5	13.5	10.5	9.5
Morse	166	53	43.5	34.5	26	20	22	17	14	11	10
Mellen	178	54	44.5	35.5	26	20	22.5	17.5	14.5	11.5	10.5
Upson	191	55	45.5	36.5	26	20	23.5	18	15	12	11
Iron Belt	196	55	45.5	36.5	26	20	23.5	18	15	12	11
Hurley	204	56	46.5	37.5	26	20	24	18.5	15.5	12.5	11.5
West of Abbotsford:											
Curtiss	76	40	32	26	21	16.5	17	12.5	10	8	7
Owen	76	40	32	26	21	16.5	17	12.5	10	8	7
Withee	78	40	32	26	21	16.5	17	12.5	10	8	7
Thorp	88	42	33	26.5	21.5	17	17.5	12.5	10	8	7
Stanley	95	42.5	33.5	26.5	21.5	17	17.5	13	10.5	8.5	7.5
Boyd	100	43	34	27	22	17.5	18.5	13	10.5	8.5	7.5
Cadott	106	44	35	27.5	22	18	19	13.5	11	9	8
Albertville	130	48	39	30.5	23	18.5	20	14	11.5	9	8
Colfax	13[illegible]	50	41	32.5	24	19.5	21	14.5	12	9.5	8.5
Wheeler	150	51	42	33.5	25	20	21	16	13	10	9
Boyceville	156	52	43	34.5	25	20	21.5	16.5	13.5	10.5	9
Downing	161	53	43.5	34.5	25	20	22	17	14	11	10
Glenwood	163	53	43.5	34.5	25	20	22	17	14	11	10
Emerald	169	53	43.5	34.5	25	20	22	17	14	11	10
Cylon	175	53.5	44	35	25	20	22.5	17.5	14.5	11.5	10.5
Jewett	179	53.5	44	35	25	20	22.5	17.5	14.5	11.5	10.5
New Richmond	184	54	44.5	35.5	25	20	23	18	15	12	11
Somerset	197	55	45.5	36.5	25	20	23.5	18	15	12	11

IT IS THEREFORE ORDERED, That the respondents, the Chicago, Milwaukee & St. Paul Railway Company and the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, discontinue the rates at present in effect upon shipments of sash, doors and blinds in carload and less than carload lots between Wausau, Wis., and the points named in table IV above, and substitute therefore the rates named in table IV above.

IN RE INVESTIGATION, ON MOTION OF THE COMMISSION, OF THE RATES, RULES AND REGULATIONS OF THE NORTHWESTERN LIGHT AND POWER COMPANY.

MAYVILLE SPECIALTY MANUFACTURING COMPANY
vs.
NORTHWESTERN LIGHT AND POWER COMPANY

Submitted Jan. 30, 1911. Decided June 26, 1911.

Petition alleging overcharges for electric current delivered to petitioner during the month of October 1910, and also alleging that respondent unjustly collected from petitioner the 5 per cent prompt payment discount for August 1910. The petition, as filed, not being sufficient to give the Commission jurisdiction, and as the facts stated were deemed sufficient to warrant an investigation on motion of the Commission, such investigation was ordered, to cover the rules and regulations of respondent.

The meters of respondent installed on petitioner's premises were tested and found to be practically correct. Data of the monthly products of petitioner's plant and of the amount of current used were compiled and are shown in tables and diagrams. It seems that an error of 1,000 kw. hrs. was probably made in the meter reading for September, which error was, of course, automatically corrected by the reading of the following month, thereby lowering the September bill and raising the October bill accordingly.

Held: That the estimated power consumption of petitioner's plant for September and October, as obtained from the data collected, bears practically the same proportionate relation to the amount of power actually metered as the corresponding ratio for November and December combined, indicating that the power metered for October, when combined with the amount for September to neutralize the error in meter reading, is not abnormal; that the collection of the 5 per cent discount complained of was proper, petitioner not having paid his bill until two days after the last discount day; that the respondent has not been guilty of overcharges and discriminating practices as charged, and no order can be made herein.

The Mayville Specialty Manufacturing Company, a corporation engaged in the manufacture of iron specialties at Mayville, Wis., filed a complaint against the Northwestern Light & Power Company, a producer of electric light and power at Mayville, alleging that the respondent company charged the petitioner for light and power for the month of October, 1910, the sum of $142.07, which charge was more than double the amount charged for light and power for any of the six months preceding said month, while it appears from the petitioner's records that in the month of October it used less power than was used during the two months preceding, in each of which the charge for power was less than half as great as for October. The petition further alleged that the respondent company had unjustly collected from the petitioner the sum of $3.88, being the 5 per cent discount for the month of August, 1910, for prompt payment of bills, whereas the petitioner before any demand was made for the said sum of $3.88 had in its possession a bill for the month of August receipted in full by the respondent company, which bill had been paid by the petitioner in the same manner as many previous bills had been paid. Wherefore, the petitioner prayed that the respondent company be required to refund the said sum of $3.88, and also the sum of $75 or such other sum as the Commission should find to have been overcharged for current furnished in October, 1910.

The Northwestern Light & Power Company, in its answer to the petition, after challenging the jurisdiction of the Commission under such petition, denied that the charge exacted of the petitioner for the month of October, 1910, was excessive, and alleged that said charge was based upon the reading of the meters installed upon the premises of the petitioner for measuring the current consumed by it, and that the charge for said month was made according to the rates set forth in the respondent's schedule of rates filed with the Commission. The respondent further admitted the collection of the sum of $3.88, which the petitioner had deducted from the gross amount of its bill for August, 1910, but alleged that the petitioner had failed to pay its August bill until after Sep. 10, 1910, on which day the right to a discount for prompt payment of bills had ceased, in conformity with the respondent's rules and regulations filed with the Commission. Wherefore, the respondent company prayed that the petition be dismissed.

The petition as filed was not sufficient to give the Commission jurisdiction of the matter complained of, since it was signed by only the petitioning corporation and its officers; but the facts stated in the petition were such as the Commission deemed sufficient to warrant an investigation upon motion of the Commission, and such investigation was accordingly ordered, to cover the rates, rules and regulations of the Northwestern Light & Power Company.

The matter was heard at the office of the Commission, Jan. 30, 1911. *E. H. Naber* appeared for the Mayville Specialty Manufacturing Company, and *Miller, Mack & Fairchild,* by *E. S. Mack* and *Mr. Blake,* for the Northwestern Light & Power Company.

The testimony introduced by the Mayville Specialty Manufacturing Company, hereinafter termed the manufacturing company, consisted mainly of figures as to the amount of current consumed by that company and the amount of product turned out by it for the six months immediately previous to the hearing. The statistics thus submitted will be presented and discussed later in this opinion. Further testimony of the manufacturing company related to the collection of the $3.88 discount. It appears that the manufacturing company paid the August bill by check dated and mailed Sep. 12, while the last discount day, according to the light and power company's regulations, was Sep. 10, and Sep. 11 was a Sunday. Previous bills had sometimes been paid on the eleventh of the month by checks dated the tenth, and the light and power company had never in such cases collected the gross bill, but had allowed the discount.

The testimony of the light and power company related to tests made by the electrician of that company of the manufacturing company's meter, which tests showed the meter to be practically correct at all times, the variation from the standard being in no case more than 2 per cent. The light and power company also introduced statements bearing upon the reasonableness of its rates and the amount of return which it was receiving upon its investment; but as it was apparent at the time of the hearing that there was no complaint concerning the reasonableness of the rates or concerning any of the regulations or practices of the company except those set forth in the manufacturing company's petition, the investigation need not, at this time, extend further than is necessary to determine whether the grievances stated in the petition have any merit.

The charges collected of the manufacturing company by the light and power company during the eight months preceding the hearing, for power alone as separately metered, were as follows:

May, 1910	$45 13	September	$52 25
June	52 54	October	124 36
July	51 68	November	82 75
August	59 95	December	107 83

These figures show that the charge for October was much higher than any charges for any of the months preceding. It is not unlikely, however, that this is, in part at least, due to an error of 1,000 kw. hrs. in the meter reading for September. Such errors often occur, and this is especially true where, as in the case of the light and power company in question, the meter readings are filled in directly, without reproducing the position of the hands of the meter upon the dial. Such errors are, of course, automatically corrected by the reading of the following month, and therefore are not generally considered very serious. If it be assumed that there was an error of 1,000 kw. hrs. in the reading for September, the September bill would become $80.75 and that for October would be $95.85.

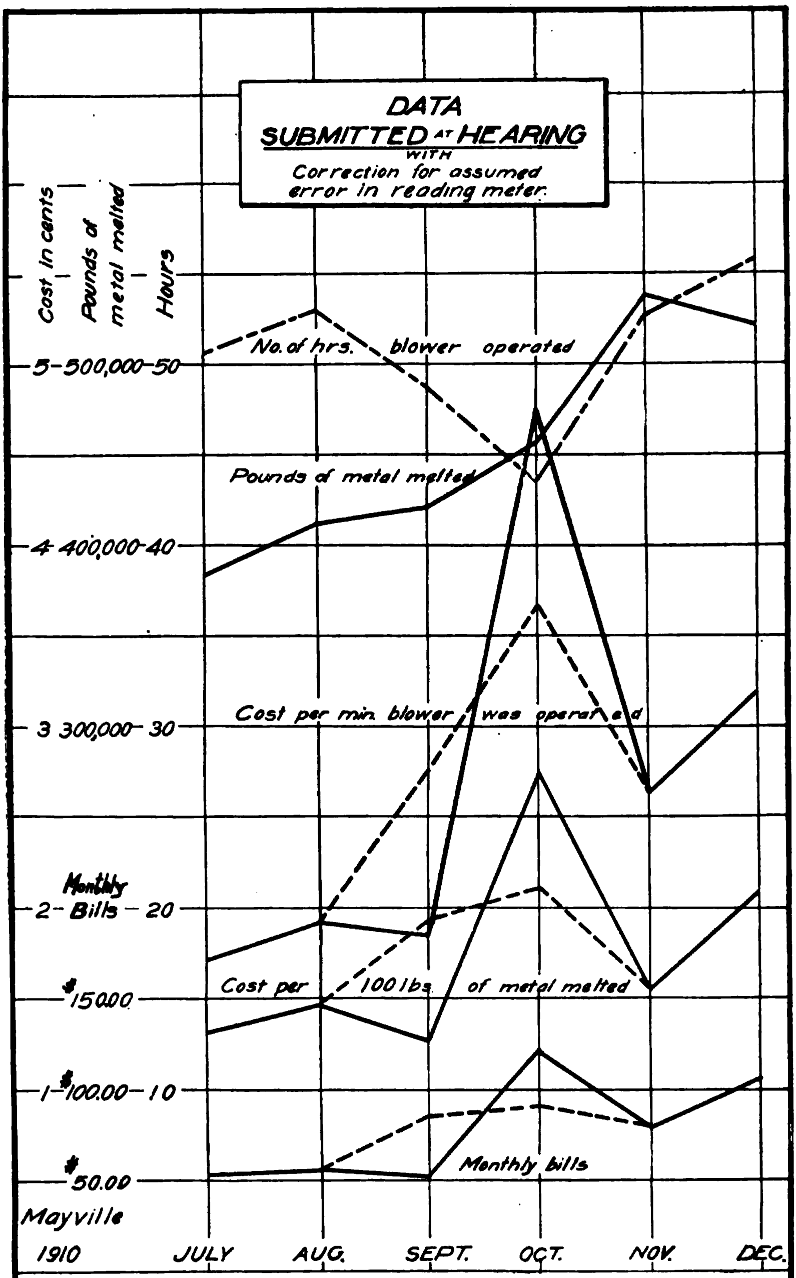
In addition to the power bills paid by it, the manufacturing company submitted a record of the operation of the large cupola in its foundry for a period of several months previous to the hearing, together with the amount of metal melted each month. Since the hearing this record has been supplemented by similar data for the first five months of 1911. The complete statement, together with the resulting cost per minute and per 100 lbs. of metal melted, follows:

Month.	No. days blower was operated.	No. minutes blower was operated.	Cost per minute, cents.	Pounds of metal melted.	Cost per 100 lbs. cents.
July, 1910	23	3,028	1.71	380,730	1.36
August	23	3,208	1.87	412,765	1.45
September	27	2,946	1.77	417,250	1.25
October	28	2,565	4.85	454,250	2.74
November	25	3,193	2.59	541,500	1.53
December	24	3,382	3.19	519,500	2.08
January, 1911	20	2,151	4.43	355,750	2.68
February	5	613	5.18	87,000	3.65
March	25	2,660	2.18	415,590	1.39
April	24	2,884	2.25	375,700	1.73
May	24	3,072	2.23	403,560	1.70
Average 11 months.	....	....	2.92	....	1.96

If the unit cost figures given above are corrected for the assumed error of 1,000 kw. hrs. in underreading the meter, the cost per minute for September will be 2.73 cts. and for October 3.73 cts., while the cost per 100 lbs. will be 1.93 cts. for September and 2.11 cts. for October.

While at first thought it might be considered unreasonable that so much variation should take place in the cost of energy per minute the blower was operated, or cost per 100 lbs. of metal melted, it should be remembered that the irregularities in changing the cupola and in atmospheric conditions affect quite materially the power required for the blower, and the size and kind of castings being produced affect the power consumption of the other equipment.

The following curves show graphically the data presented at the hearing as to the amount of monthly bills, cost per 100 lbs. melted, and cost per minute of operation of the blower, all of which are modified as shown in the dotted lines by the correction of the error in underreading. The same diagram shows the number of pounds of metal melted and the number of hours the blower operated in each month. The increase in number of pounds melted in September over that in August lends further assurance to the assumption that the meter reading for September was too low:



Dotted lines in three lower curves indicate correction assuming underreading of 1000 K.W. Hrs. Sept. 28.

As to the accuracy of the meter registering the power used by the manufacturing company, the results of the tests made by the light and power company's electrician were confirmed by tests made in the presence of an inspector of this Commission. The meter was found to be properly connected and to register within the prescribed limits of accuracy, the electrician's methods of testing were found to be correct, and a thorough examination of the meter showed that the registering mechanism was in perfect condition.

In addition to the facts submitted at the hearing regarding the output of the manufacturing company, the Commission's inspector secured from the records of that company the data summarized in the following table, relating to the product turned out by the manufacturing company:

MONTHLY PRODUCT IN POUNDS.

	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Boiler arches. not milled	2,000	1,580	6,000	3,750	2,000	1,050
Sash weights, milled	267,193	234,159	157,966	150,319	338,462	388,774
General castings:						
Not milled:						
Grate bars	2,455					
Sheaves	400					
Elevator weights		34,485	17,250			45,530
Hitching weights		3,905		2,550	330	
Stanchions		110				
Miscellaneous			678	45		290
Milled:						
Washers	1,955		2.500	1.500	650	
Cover rings		10,362	61.705	114,450		
Post mauls				150	3.450	
Total	274,003	284,601	246,099	272,764	344,892	435,644

TOTAL SIX MONTHS.

	Milled.	Not milled.	Total,
Boiler arches		16,380	16,380
Sash weights	1,536,873		1,536,873
General castings	196.722	108,028	304,750
Total	1,733,595	124,408	1,858,003

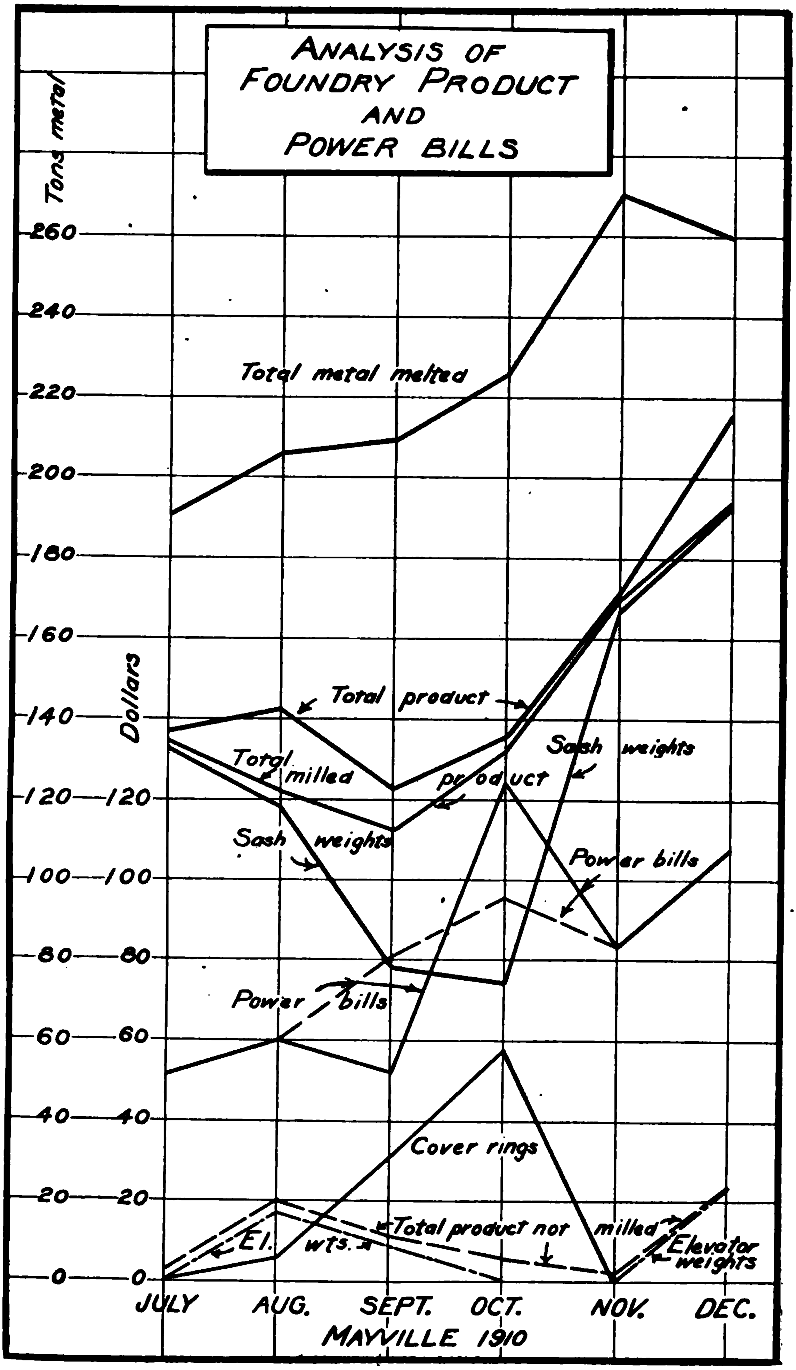
The motors installed in the plant of the manufacturing company are as follows:

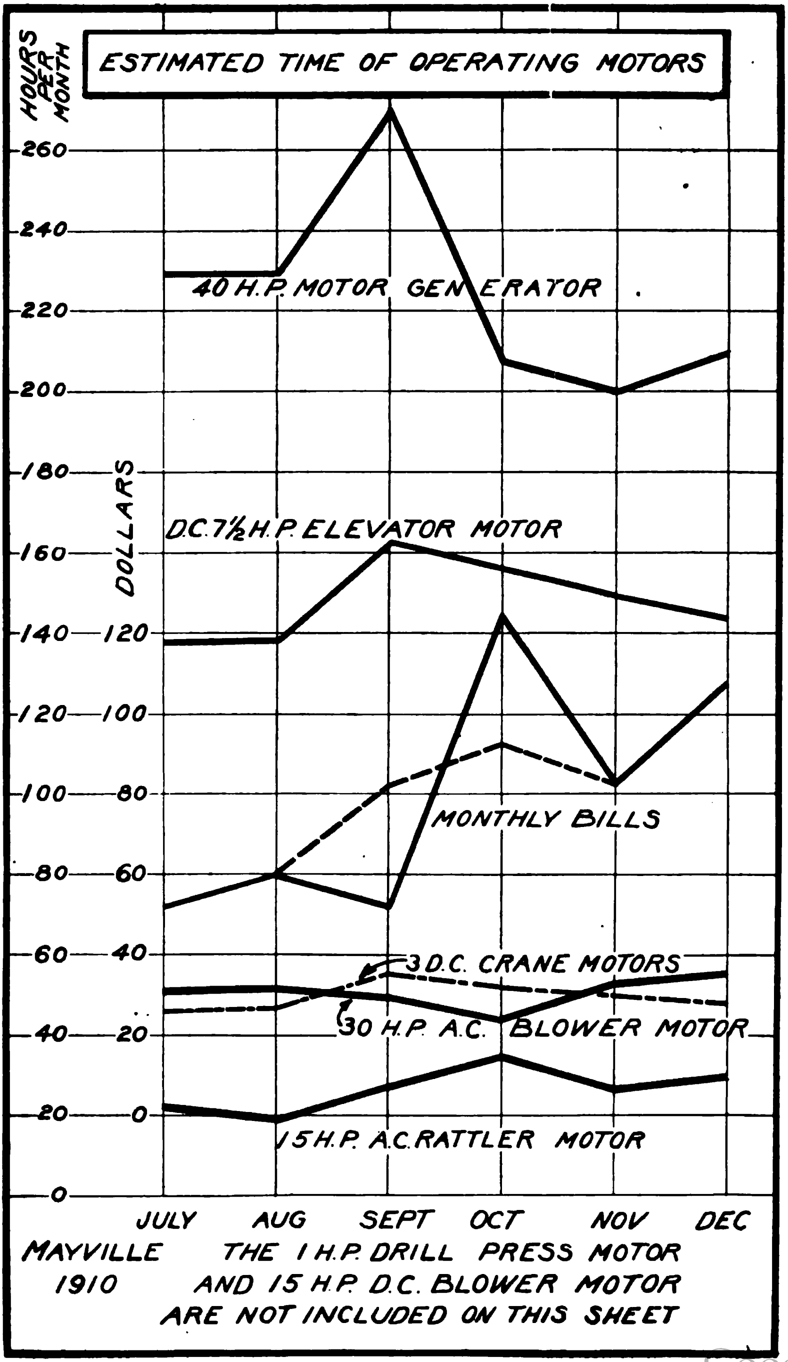
- 1 30 h. p. motor running No. 8 Sturtevant blower on No. 5 cupola.
- 1 15 h. p. motor running one large and one small rattler and emery wheel.
- 1 1 h. p. motor running drill press.
- 1 40 h. p. motor-generator set furnishing current to:
  - 1 15 h. p. motor on blower for No. 2 cupola.
  - 1 7½ h. p. motor on charging elevator.
  - 3 motors on 20,000 lb. crane.
  - 1 motor of about 2 h. p. capacity on buzz saw, emery wheel and 12 ft. lathe.

The following is the capacity of the rattlers as estimated by the manufacturing company and used as a basis for the hours of use of rattlers in the curves which are reproduced below:

	Large rattler, lbs. capacity.	Small rattler, lbs. capacity.	Total lbs.
Cover rings	2.000	500	2.500
Sash weights	5,500	1,400	6.900
Post mauls	5.000	1.250	6.250
Washers	5.000	1,250	6,250

The first of the following diagrams shows the amount of product of various kinds which the manufacturing company turned out during the last six months of 1910, and also the power bills collected of it, with a dotted line showing the same bills corrected for the underreading in September. The second diagram compares the monthly bills of the manufacturing company with the estimated hours of operation of its various motors.


ANALYSIS OF
FOUNDRY PRODUCT
AND
POWER BILLS
Tons metal
Dollars
260
240
220
200
180
160
140
120
100
80
60
40
20
0
120
100
80
60
40
20
0
Total metal melted
Total product
Total milled product
Sash weights
Power bills
Cover rings
El. wts.
Total product not milled
Elevator weights
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
MAYVILLE 1910


ESTIMATED TIME OF OPERATING MOTORS
HOURS PER MONTH
DOLLARS
260
240
220
200
180
160
140
120
100
80
60
40
20
0
120
100
80
60
40
20
0
40 H.P. MOTOR GENERATOR
DC 7½ H.P. ELEVATOR MOTOR
MONTHLY BILLS
3 D.C. CRANE MOTORS
30 H.P. A.C. BLOWER MOTOR
15 H.P. A.C. RATTLER MOTOR
JULY
AUG
SEPT
OCT
NOV
DEC
MAYVILLE
1910
THE 1 H.P. DRILL PRESS MOTOR AND 15 H.P. D.C. BLOWER MOTOR ARE NOT INCLUDED ON THIS SHEET

As a result of the data collected and presented above in graphic and tabular form, it is found that the estimated power consumption of the manufacturing company for September and October combined, as obtained from such data, bears practically the same proportionate relation to the amount of power actually metered, as the corresponding ratio for November and December combined. This indicates that, as compared with other months, the amount of power metered for October, when combined with the amount for September so as to neutralize the apparent error in meter reading for September, is not abnormal. This fact, taken with the fact that the meter has been tested at several different times and found practically correct, would seem to indicate clearly that the manufacturing company has been charged for no more current than it has consumed, and that it is not entitled to any refund on the ground of erroneous registration of the meter.

As to the other branch of the manufacturing company's complaint, relating to the collection of the $3.88, which represents the difference between the gross bill and the net bill payable before the tenth of the month, it need only be said that the evidence clearly shows that the bill in question was not paid until Sep. 12. It is undoubtedly true that the light and power company has at times in the past accepted payment of the net bill on the eleventh of the month by check dated and mailed on the tenth. An official of the light and power company testified that the company had since November, 1910, refused to accept such payment. However much the rule may have been relaxed in the past, the fact remains that the rule requires payment to be made by the tenth of the month in order to obtain the benefit of the discount, and since the manufacturing company admits that payment was not made by that day, it has no right to claim a refund of the amount of the discount. It is not alleged that the light and power company has been enforcing the rule as to some consumers and relaxing it as to others, so as to constitute unjust discrimination. Therefore, the manufacturing company has no ground for complaint that the rule as filed with the Commission is strictly enforced against it.

For the reasons above stated, we find that the Northwestern Light and Power Company has not been guilty of the overcharges and discriminating practices charged in the complaint of the Mayville Specialty Manufacturing Company, and, therefore, that no order can be made as the result of the investigation made by the Commission.

IN RE DETERMINING AND FIXING A JUST COMPENSATION TO BE PAID TO THE MANITOWOC WATER WORKS COMPANY BY THE CITY OF MANITOWOC FOR THE PROPERTY OF SAID COMPANY ACTUALLY USED AND USEFUL FOR THE CONVENIENCE OF THE PUBLIC.

Submitted March 15, 1911. Decided June 27, 1911.

Notice was filed with this Commission by the common council of the city of Manitowoc on Jan. 20, 1911, that by a vote of the majority of the electors it was decided to purchase the plant and property of the Manitowoc Water Works Company. A tentative valuation, of date Jan. 1, 1911, found the total cost new of the physical property of said plant, including paving, and stores and supplies, and non-operating property, to be $249,440, and present value $231,647.

Held: That in determining the value of the physical property of a public utility, the three elements of the greatest importance in fixing the value of such plants are the original cost, cost of reproducing the plant, and the present value. As to which of these elements shall be given the greatest consideration, must depend upon the circumstances in each case and upon the purpose for which the valuation is made.

The company claimed a value on the suction well considerably greater than the allowance made in the tentative valuation, and supported its claim by affidavit of the builder describing unusual conditions and great difficulties encountered in the construction of the well.

Held: That the public has a right to expect the exercise of good judgment and reasonable intelligence on the part of those who are responsible for the expenditure of large sums of money in work on a public utility; if it can be shown that such reasonable judgment and intelligently directed effort was lacking, it would appear that the original cost is not a true measure of the value of the work. If, on the other hand, the work was carried out in accordance with the best available judgment and plan, then it would seem that the extra cost might, on equitable grounds, be entitled to consideration in a valuation of the plant.

The city objected to inclusion of value of filter galleries, claiming that these galleries were not a necessary and useful part of the equipment of the plant.

Held: That the filter galleries constitute a part of the experimental work, conducted to secure a water supply; that they are now used and useful as storage reservoirs and should be included in the valuation.

The city objected to the inclusion of the value of river intake, as inadequate for the purpose intended, at present neither used nor useful.

Held: That the river intake was required by the city; that the conditions which have rendered it dangerous to the health of the

community have been conditions over which the company had no control, and that in justice and equity the company could not be deprived of all of the value of this item.

The city objected to the five year average prices of equipment used by the staff, and insisted that current prices should be used.

Held: **That it is not believed to be either just or reasonable to permit current prices due to temporary and abnormal conditions to govern in the determination of value, either for the purpose of sale or rate-making.**

The company claimed a value for water supply over and above the cost of development and the value of the physical property utilized. The main supply is from ground water. Investigation disclosed that part of the water supply comes from the lake; that the supply is pure and satisfactory and is adequate to meet present demands, is susceptible to further development, is in danger of contamination, and constant care and watchfulness must be exercised to safeguard it, and that the value of this supply does not exceed the cost of developing and discovering same, as estimated by the engineers of the Commission.

Held: **That the value of the property used and useful for the convenience of the public in this proceeding, is the sum of $236,000, plus the value of the materials and supplies on hand at the time of the transfer of the ownership of the plant, and plus also the cost of any extensions that may have been made since Jan. 1, 1911, up to the time of the transfer.**

The Commission was notified Sep. 25, 1907, by the city attorney of Manitowoc that the said city contemplated bringing some proceedings against the Manitowoc Water Works Company before the Commission, and that for this reason it desired to have some information as to the valuation of this plant, and wanted to know when the Commission would proceed to value it. In response to this, the Commission ordered a valuation of the physical property of the company, and a tentative valuation of date Dec. 1, 1907, was later submitted by the engineer of the Commission.

A hearing or conference on the matter of the valuation of the property of the Manitowoc Water Works Company was held at the office of the Commission on Jan. 21, 1908, which hearing was resumed and completed Feb. 19, 1908. At these hearings the following appearances were entered: *M. G. Jeffris* for the Manitowoc Water Works Company, and *A. L. Hougen,* city attorney, for the city of Manitowoc.

Under both the law and the practice no decisions are issued or orders made by this Commission except in formal proceedings. The valuation placed upon utilities depends, to some extent at least, upon the purposes for which it is intended. For instance, in valuing utilities for the purpose of condemnation and purchase, many elements must often be taken into account which should not be given any consideration in valuations made for the purposes of rate making. The proceedings in this case were informal in their nature. The Commission had no information as to the purpose for which the valuation thus desired by the city of Manitowoc was intended.

In view of these facts it was deemed proper and best not to carry the investigation farther until such further proceedings had been started as the city evidently had in mind, and not to issue any decision or order herein until the point had been reached where the issues raised in such proposed proceedings were to be passed upon. It was also assumed that the tentative valuation of the engineers of this Commission, together with the facts and the arguments that were presented at the hearing, furnished the city with such preliminary information as it desired or could expect in advance of full investigations and hearings upon all the issues involved.

Subsequent to the hearings in the above described informal proceedings, this Commission stood ready to continue the investigations in connection with any related and proper proceeding that may have been brought by the city and to promptly pass upon the issues raised therein. To have gone any further under the informal proceedings would, in effect, have amounted to deciding many of the most important issues in advance of proper proceedings. This course would not have been fair and just to all concerned, and, therefore, we could hardly have been expected to take it.

On Jan. 20, 1911, the following notice was filed with the Commission:

"Notice is hereby given to you that the city of Manitowoc, a municipal corporation, located in Manitowoc county in the state of Wisconsin, has determined to acquire the water works plant of the Manitowoc Water Works Company, located and existing in said city, by a vote of the majority of the electors voting thereon, at a special election held in and for said city on Jan. 17, 1911, at which special election the question of the purchase of such plant was submitted. Hereto attached and made a part hereof are certified copies of portions of the records of the proceedings of said city and its board of aldermen. The public utility owning said plant has consented to the taking over of said plant by the municipality by acceptance of an indeterminate permit as provided by law. The said Railroad

Commission of Wisconsin is, therefore, requested to take such proceedings in the premises as required by law."

Dated Jan. 19, 1911.

City of Manitowoc,
By C. A. Groffman,
its Mayor.

Attest: Arthur Reichert,
City Clerk.

Pursuant to notice fixing time and place of hearing in the above named proceedings for Jan. 31, 1911, at the office of the Commission, the following appearances were entered: *A. L. Hougen*, city attorney, and *Isaac Craite*, of counsel, for the city of Manitowoc; and *M. G. Jeffris* for the Manitowoc Water Works Company.

Adjourned hearings were held at the office of the Commission on Feb. 15, 1911, and March 15, 1911, when all the testimony was introduced and the hearings closed. In addition to the testimony introduced at the above hearings, the testimony brought out in the hearings under the informal proceedings, already described, were made a part of the record in this proceeding.

VALUATIONS OF PHYSICAL PROPERTY.

In determining the value of the physical property of a public utility several elements must be taken into consideration. The three elements of greatest importance in fixing the value of such plants are the original cost, the cost of reproducing the plant, and the present value. As to which of these elements shall be given the greatest consideration, must depend upon the circumstances in each case and must also depend upon the purpose for which the valuation is made. See *Hill et al. v. Antigo Water Co.* 3 W. R. C. R. 623, 631; *In re Menominee and Marinette Light and Traction* Co. 3 W. R. C. R. 778, 785–787; *State Journal Prtg. Co. et al. v. Madison Gas & Electric Co.* 4 W. R. C. R. 501, 557.

The original cost of the plant, if the records are properly kept, should prove of great assistance in arriving at a fair value of the property. Unfortunately these records are not available in this instance. Very little information was brought out in the hearing and investigation as to the original cost of construction of the Manitowoc water works. What information was secured is in the nature of testimony given by persons connected with the plant in its construction period and consists mostly in their recollection of the cost of building certain parts of the system, such as the wells and river crossings.

We are, then, compelled to rely chiefly upon the figures for the cost of reproducing the plant and its present value as determined by the engineer of the Commission, together with the facts brought out in the hearing, in order to arrive at a valuation of the property in question. The tentative valuations furnished the basis for the discussion and arguments at the hearings, the objections of the company and the city being directed at the values contained therein. The first tentative valuation, of date Dec. 1, 1907, is reproduced below:

TABLE I.

TENTATIVE VALUATION OF PHYSICAL PROPERTY.

December 1, 1907.

Group.	Classification.	Cost of reproduction.	Present value.
1	Land	$11.140	$11,140
2	Wells, intake and suction	18,865	17.021
3	Stand pipe	12.682	10.482
4	Distribution system	139.743	136,873
5	Pumping plant equipment	7.585	3.140
6	Buildings and misc. structures	10,282	8.280
7	Office furniture and appliances	571	406
8	Tools	556	278
9	Miscellaneous	297	148
	Total of items 1—9	$201,721	$187.768
10	Add 10% (see note below)	20,172	18,777
	Total of items 1-10	$221,893	$206.545
11	Stores and supplies	2,123	2.123
	Total of items 1-11	$224,016	$208.668
12	Paving	769	769
	Total of items 1—12	$224.785	$209,437

NOTE:—Addition to cover engineering and superintendence, interest during construction and contingencies.

When the formal proceedings were brought, a new valuation was made by the staff which represents a revision of the tentative valuation of Dec. 1, 1907, in the light of further investigations by the staff and with the purpose of bringing the inventory up to date. This appraisal is summarized in table II, which follows;

TABLE II.

VALUATION OF PHYSICAL PROPERTY.

January 1, 1911.

Group.	Classification.	Cost new.	Present value.
1	Land	$6,160	$6,160
2	Wells, intakes and suctions	25,433	22,936
3	Reservoirs and standpipes	19,138	16,025
4	Distribution system	142,449	139,377
5	Power plant equipment	8,895	5,087
6	Buildings and misc. structures	10,349	7,926
7	Office furniture and appliances	639	436
8	Tools	839	419
9	Horses, wagons and misc.	....	....
	Total of items 1—9	$213,902	$198,366
10	Add 12%[1]	25,668	23,804
	Total of items 1—10	$239,570	$222,170
11	Stores and supplies	2,840	2,840
	Total of items 1—11	$242,410	$225,010
12	Paving[2]	6,480	6,356
	Total of items 1—12	$248,890	$231,360
13	Non-operating property	550	287
	Total of items 1—13	$249,440	$231,647

[1] Add 12% for engineering, superintendence, interest during construction, contingencies, etc.

[2] Paving actually disturbed amounts to $100 (cost new), and $98 present value.

No attempt was made in the above inventory to include the value of fuel and oil on hand, this value being left for adjustment on the date of the transfer of the property. It is also noted that the value of the land appears at a higher figure in the first valuation—table I—than in the second valuation—table II. This is due to the fact that no estimate is made in the second appraisal of the value of the water supply. The question of the value of this item will be taken up under the head of "Water supply."

Both the city and the company entered objections to the valuation of certain items as fixed by the staff. These objections, in practically all cases, apply as regards both the first and last valuations. The contentions of both parties are set forth in the discussion of each group which follows:

LAND.

The present value of the land owned by the company is given by the staff as $6,160. This amount covers the stand pipe site, including recent dockage improvement, and the site occupied by the pumping station and wells. The value of the land thus assigned by the staff is not sufficient, the company asserts, to cover the real value of this property. The company contends that the staff has not given sufficient weight to the great increase in the value of land generally in Manitowoc since the company acquired the property under consideration. The methods used by the staff in arriving at the value of the land have been carefully described and analyzed in the decision of the Commission in *State Journal Prtg. Co. et al. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 528. In view of the facts we believe the staff's valuation of the land should stand.

WELLS, INTAKES AND SUCTIONS.

In the valuation of Dec. 1, 1907, this group was given a cost new of $18,865, and a present value of $17,071. In the valuation of March 1, 1911, the cost new appears as $25,433, and the present value as $22,936.

Suction Well.

The cost of reproduction of the suction well was first estimated by the staff as $2,100, present value $2,037. The company contended that the original cost of construction of this well was between $6,000 and $7,000. This claim was supported by an affidavit of A. R. Shannon, who built the well. In his affidavit Mr. Shannon described in detail the construction of the well and enumerated the difficulties overcome in sinking it, and stated that the well cost between $6,000 and $7,000.

It appears that subsequent to the date of the first valuation certain alterations or improvements have been made on the well in question, and this fact, together with additional information brought out at the hearings and by further investigation, has caused the staff to place the value of the well in its recent appraisal as $4,221 cost new, and $4,085 present value. This includes the roof and ventilator.

With the above revision there still remains a wide margin between the cost claimed by the company and the value fixed by the staff. The suggestion was made that Mr. Shannon might not have proceeded in the most practical manner to build this well, and that if the most practical methods had been employed the cost would not have run up to any such large figure as Mr. Shannon gave in his affidavit. But the company contended that, even when conceding that the engineer's estimate represented the fair value of the well and that the original cost was high due to impractical methods of constructing, it was still entitled to a value based upon the original cost and not on an estimate of the cost of reconstruction new.

The public has a right to expect the exercise of good judgment and reasonable intelligence on the part of those who are responsible for the expenditure of large sums of money in work of this character in a public utility undertaking. If it can be clearly shown that such reasonable judgment and intelligently directed effort was lacking, then it would appear that the original cost is not a true measure of the value of the work in question. If, on the other hand, the work was carried out in accordance with the best available judgment and plans, then it would seem that the extra cost might, on equitable grounds, be entitled to consideration in the valuation of the plant. In view of the facts, however, we do not think the figures of the staff should be increased.

In the ordinary operation of the works, the water is pumped from the suction well and not directly from the producing well or galleries. The city sought to show that the suction well was unnecessary and neither useful nor valuable, the suggestion being that the pumps might just as well take the water directly from the producing well, and that, therefore, the value allowed for the suction well should be dropped from the valuation.

This was emphatically denied by the manager of the water works, who declared that it was essential to have the suction well separate from the supply well. Witness declared that to put the suction into the supply well directly would be a source of annoyance, bad service, and no economy.

It appears as a general proposition that pumping from the suction well and not directly from the supply well follows good practice in water works operation, and that the suction well in this system is both used and useful in the operation of the plant.

Filter Galleries.

The first informal valuation of Dec. 1, 1907, allowed a cost new of $1,840 and a present value of $1,693. The valuation of Jan. 1, 1911, assigns to the filter galleries a cost new of $2,595 and a present value of $2,206.

Evidence was introduced by the company to show that the above valuation should be substantially increased. The affidavit of A. R. Shannon, who built the galleries, was introduced, wherein the original cost was stated to have been $3,700. The operating manager of the company, a man of wide experience in water works construction, testified that the galleries could not be reproduced for less than $4,000. A prominent water works engineer, Mr. Wheeler of Chicago, testified that he had figured on the cost of replacing the galleries in question. Mr. Wheeler stated that his first estimate was $6,000, but that in the light of additional information he had modified that figure and would give as his final estimate from $3,500 to $4,000 as the cost of reconstruction new. The estimates, witness stated, included a contractor's profit of 15 per cent.

Some effort was made by the city to have the value of the galleries excluded from the valuation of the plant, on the grounds that they were not useful or valuable as a part of the system. It appears that the original plans called for the construction of these galleries as the water producing feature of the plant. It appears further that the galleries failed as a source of supply and that they have since been used as storage reservoirs.

As a means of storing water these galleries appear to be used and useful as a part of the plant. Furthermore, as previously described, these galleries constituted a part of the experimental work conducted to secure a source of supply, and it would seem that the cost of the galleries should be a legitimate charge to the construction or a part of the investment necessitated in the building of the system. In view of these facts it seems only just that the cost of these galleries should receive consideration herein. In the light of the investigations made, it is believed that the staff's figures should stand.

River Intake.

In the valuation of Jan. 1, 1911, the river intake is given a cost new of $10,774, and a present value of $9,035. The city contended that the cost of the river intake should not be included in the valuation. It argued that this intake constituted a menace in the direction of contamination of the domestic water supply, for the reason that the river water is impure and the injection of this water into the mains, as in the case of a large fire, would subject the city to grave hazard of contagious disease. That the river water is impure and dangerous from a sanitary point of view, is beyond dispute. That the public is entitled to full and complete protection from this danger, is also a fact beyond question. It appears that, following the hearing in this matter, the company has so enlarged its well supply as to render the river intake a less necessary precaution in case of fires.

The company was required and compelled by the city to build this intake. From the point of view of fire protection its construction was also a step in the right direction.

It further appears that the city built or authorized to be built the sewers which empty into the river above the river intake. In short, while compelling the company to build the intake, the city seems to have made no effort to protect the water above it from becoming contaminated and from rendering the use of the intake a menace to the public health. The presence of the sewer outlets and the consequent pollution of the river water is a matter over which the company had no control and for which it is in no way responsible.

As a matter of simple justice it would hardly seem fair to deprive the company of the value of property which it installed at the order of the city and which the city failed to protect and rendered valueless by its own actions. In other words, if the intake is of comparatively little value today, it is so because of conditions for which the city is in a large measure responsible. To entirely exclude it from the valuation would, for these reasons, hardly seem fair.

RESERVOIR AND STANDPIPE.

The valuation assigned by the staff to cover the cost of the steel and masonry and labor erecting the standpipe, together with the electro-hydraulic valve installed complete, is $12,682 cost new and the present value $9,569. Since the first appraisal was made, additional storage has been provided by the construction of a reservoir. The cost new of this structure is given as $6,456 and present value $6,456, there being no depreciation.

The city claimed and sought to show that the standpipe has depreciated to a greater extent than the present value allowed by the staff would indicate, and that the life of the standpipe, as used by the staff, is too great. It appears from the testimony and from careful examinations that the standpipe has been maintained in fairly good condition and that no facts are known which would tend to lower the present value assigned by the staff.

RIVER CROSSINGS.

The company was compelled to establish and construct two river crossings in extending its distribution mains, one of which is known as the Ninth street crossing and the other as the Wisconsin Central bridge crossing. The appraisal of Jan. 1, 1911, shows a somewhat higher valuation for these crossings than was given by the staff in the first valuation. The revision has been made after securing further information in regard to the difficulties connected with the construction of the crossings in question and in the light of other facts revealed by further investigation.

The operating manager of the company testified that he had charge of the construction of the crossings in question, the work being done before he became financially interested in the company. Witness described the great difficulties encountered in the construction of the crossings, and, while unable to produce records showing the cost of the work, was positive that the Ninth street crossing cost between $9,000 and $10,000, and that the Wisconsin Central bridge crossing could be laid for about $4,000. He also pointed out that at the Ninth street crossing the excavating work was very difficult, running gravel being encountered, and that in order to reach the required depth of twenty-two or twenty-three feet it was found necessary to take in eighty or ninety feet of excavation. The use of a dredge, a diver, and a pile driving outfit was also required in the progress of the work. The caving of the bank during the excavation work threatened several buildings upon the shore, and the builder was compelled to go to considerable expense to protect the property from damage.

The company, it appears, had requested two well known contracting firms to make estimates as to the probable cost of reproducing the crossings in question. These bids or estimates were submitted by the firms mentioned with full knowledge that they were not competitive bids, and with no expectation of doing the work they were asked to estimate upon.

The estimate of the Starke Dredge & Dock Co. applied only on the Ninth street 16-inch crossing, and was $7,985, exclusive of the pipe and specials. The Wheeler Co. made an estimate of $9,147 on the 16-inch crossing, and about $6,972 on the 8-inch crossing, these bids being inclusive of all labor and materials. Mr. Wheeler testified that the above estimates included from 15 to 18 per cent for contractor's profit.

The various estimates of the cost of the river crossings which have thus been presented may be summarized as follows:

	16 inch.	8 inch.
Engineer of Commission.		
Cost of reproduction	$7,669	$2,782
Present value	7,595	2,755
Wheeler:		
Cost of reconstruction	9,147	6,972
Starke Dredge and Dock Co.		
Cost of reconstruction not including pipe and specials	7,985	....
Original cost (testimony of company's manager)	9,000 10,000	4,000

While the testimony seems to be very conflicting as regards the value of these river crossings, and while the staff's figures are comparatively low as compared with the other estimates, we do not feel that any increase in the staff's figures would be justified.

DISTRIBUTION SYSTEM.

The cost new of this group is given in the staff's appraisal of Jan. 1, 1911, as $142,084, with a present value of $139,057. It is the contention of the city that the staff's valuation of the distribution system is excessive for the following reasons:

(1) Too large an allowance has been made for freight.

(2) The unit prices for mains and specials are excessive, and further because the present prices should govern instead of taking the five year average price. The city claims that the evidence and computations show that the cost of reproduction of the group would be $11,520 less on a current price basis than on the five year average price basis.

(3) An insufficient amount has been deducted for depreciation in order to arrive at a fair present value of the system.

(4) Too large an amount is allowed for trenching and laying pipe. It is asserted by the city that 5½ feet of covering is considered ample to protect the mains from freezing and that no allowance should be made for the cost of laying at a greater depth.

(5) Insufficient allowance has been made for the depreciation of the wrought iron mains.

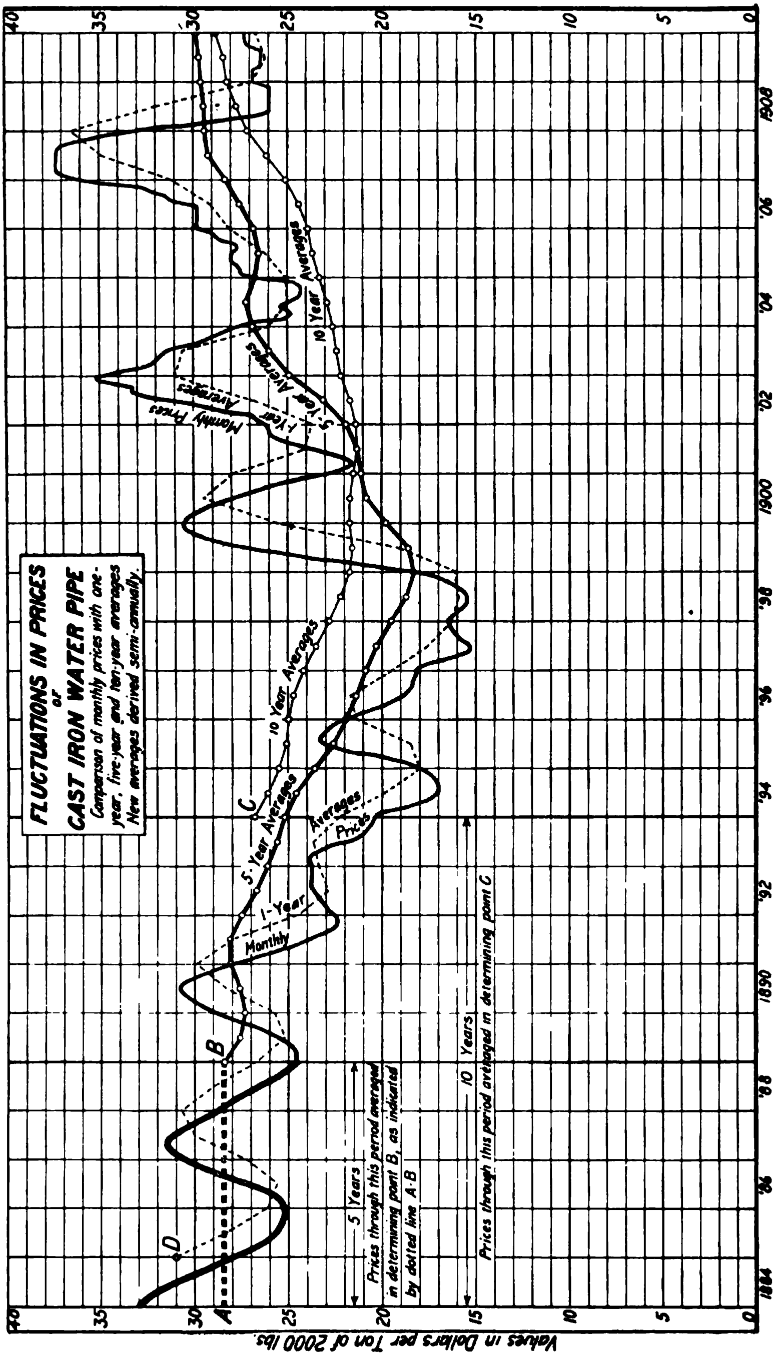
On the other hand the company insists that the valuation of the distribution system, as made by the engineers, is inadequate to cover the actual value of the group. The company also offered evidence to show that the cost of labor is now substantially one-third higher than at the time the plant was built, and that, notwithstanding this fact, the records show that the prices used by the staff are little, if any, higher than the actual costs incurred at the time of construction.

In reply to the city's contention that too large an allowance has been made by the staff for depth of trenches, the company points to the fact that the ordinance only fixes the minimum depth at which the mains should be laid, that experience shows that the depth at which the company has laid its mains is, in view of the climatic conditions, not excessive, and that the prices used by the staff are based upon actual figures as regard to the depth of the trenching.

Basis of Prices.

It is the contention of the city that the current prices of materials rather than a five year average of prices should govern in the determination of the present value of the physical property of the company. Practically the only difference in value which will arise due to the use of these two methods occurs in the valuation of the distribution system. A valuation based on five year average prices will, the city claims, be about $11,500 greater than a valuation based on current prices as of March 1, 1911.

The views and methods of the staff in regard to the establishing of unit prices have been clearly outlined in the decision of the Commission in *City of Appleton v. Appleton Water Works Co.* 5 W. R. C. R. 215, 228. The diagram which was shown in the above decision is reproduced herein. This diagram shows the fluctuation in the prices of cast iron water pipe over a period from 1884 to 1909, inclusive:



FLUCTUATIONS IN PRICES
of
CAST IRON WATER PIPE
Comparison of monthly prices with one-year, five-year and ten-year averages. New averages derived semi-annually.

It will be noted that at about the close of 1907 the current price curve dropped below the five year average line, and at this date the current price line is still somewhat lower than the five year average. It will be noted that during 1907 the current prices were considerably higher than the average prices. It is extremely doubtful whether those interested in keeping the valuation down would have contended that current prices should have controlled during that period. Whether the prices should be based on a ten year average, five year, two year, or one year average, may properly be a matter for consideration and will perhaps be open to argument, but in view of facts as regards the variation of current prices from month to month, it does not appear just or reasonable to allow current prices to govern in the determination of value, either for the purpose of sale or rate making. Based on a one year or upon a two year average basis, it appears that the unit price will be lower in this case than when the five year average is used. This fact should, perhaps, be given weight in arriving at the valuation considered herein.

Depreciation of Mains.

The city believes that the staff has failed to make a sufficient allowance for depreciation of the distribution system and that for this reason the present value is higher than it would be if the correct deduction from the reproduction cost were made. The city points to the valuation of the Fond du Lac Water Co., where a larger deduction for depreciation of the distribution system was made. It should be mentioned in this connection, perhaps, that the Fond du Lac system, among other things, differs from the Manitowoc system in that the Fond du Lac system is made up of about 26 per cent of wrought pipe, as against about 8.4 per cent of this pipe in the Manitowoc system.

The company insists that the weaker sections of the distribution have been removed and that, in fact, the system is better today than when it was first built, and that for this reason the system should not be depreciated as much as the staff's figures show. As regards the contention of the city that too large an allowance for freight has been made by the staff on the items in this group, it does not appear from investigation that this allowance is in any way excessive.

From a study and analysis of the facts before us respecting the valuation of the distribution system, and in view of these and other facts, it does not appear to us that any increase over the staff's figures can be made. On the other hand, we are inclined to the view that a somewhat lower valuation would be more in line with the facts.

POWER PLANT EQUIPMENT.

The cost of reproduction new of this group is fixed by the staff at $8,895 and the present value at $5,087, or a depreciation of $3,808. The details of the power plant equipment are shown in the following table:

POWER PLANT EQUIPMENT.

STAFF'S VALUATION.

January 1, 1911.

	Item.	Cost of reproduction.	Condition per cent	Present value.
2	60 inch x 16 ft. fire tube boilers	$2,110	35	$804
1	60 inch x 16 ft. fire tube boiler	1,275	93	1,189
2	12 x 20 x 14 x 15 Worthington duplex pumps	3,600	61	2,232
1	6 x 4 x 6 Worthington duplex boiler feed pump	95	78	74
1	5 x 7 x 10 Worthington jet condenser	400	35	156
1	4 x 6 closed heater	75	35	26
1	4 x 4 vertical single cylinder engine and No. 4 Sturdevant blower	130	55	72
	Piping	972	35	418
	Pipe covering	18	35	6
	Belting	10	50	5
	Boiler and pump accessories	210	50	105
	Total	$8,895	....	$5,087

The company objected to the low condition per cent given to the two boilers above listed at $804 present value and 35 per cent condition, and claimed a present value much greater than that allowed by the staff.

The company insisted that the boilers were in good condition, that they had been rebuilt some twelve years previous, that they were frequently inspected and were approved by underwriters as capable of carrying 100 lbs. pressure. The company further pointed out that the boilers were alternated in service, month by month, and that they were never crowded except in case of unusual fires. These were all facts. the company claimed, which would tend to give these boilers a longer life than that allowed by the engineer of the Commission.

Prof. D. W. Mead testified that the value of a boiler must be determined by critical expert inspection of the particular boiler and that the general application of the life curve was unsafe. Prof. Mead stated that the life of a boiler depends entirely upon its use, that new boilers of the best type have been destroyed in two years with bad use, while with good care and without overloading some boilers have been in operation for twenty years or more and are still useful. Witness declared that water works service is of a kind that leads to a long life of boilers, because as a rule they are used at much below their rated capacity. Prof. Mead would place the life of a water works boiler at fifteen to twenty years as an average, but held that the element of care and use is of the utmost importance as affecting the life of a boiler.

The engineer of the Commission admitted that the boilers were in good condition and would be vouched for by a good insurance company, but he insisted that irrespective of that fact a boiler must depreciate with age and service, and he adhered to his belief that the valuation under consideration did not depreciate the boilers in question too fast, considering their age. These boilers have been rebuilt and restored to a condition perhaps as good as new, but this rebuilding was done about twelve years previous to the valuation, and the fact that they were rebuilt would seem to indicate that they had depreciated considerably at the time of rebuilding.

The estimates made by the staff are based upon a full understanding of the history of the boilers in question, upon critical inspections of the boilers and upon a wide investigation of the life of boilers in this class of service, and the present value as allowed by the staff should stand.

As regards the pumps and other equipment included in this group, careful consideration of the testimony introduced by the company, tending to raise the per cent condition allowance and present values, has been given. In the light of the particularly thorough investigations made by the staff in respect to these items, we believe the present values as determined by the staff should stand.

BUILDINGS AND MISCELLANEOUS STRUCTURES.—OFFICE FURNITURE AND APPLIANCES.—TOOLS.

There appears to be a substantial agreement between the staff and the city as regards the present value of these groups. The company introduced some testimony tending to show that the buildings had been depreciated by the staff to a lower figure than the actual conditions warranted.

ALLOWANCE OF TWELVE PER CENT FOR ENGINEERING, INTEREST DURING CONSTRUCTION, ETC.

The staff has taken 12 per cent as a fair allowance on the cost of the physical property to cover the items of engineering, superintendence, interest during construction, contingencies, etc.

The city contends that 12 per cent is too large and that 10 per cent would more nearly represent the actual costs incurred for these items in connection with the construction of the plant in question. This allowance also covers the expenses for legal work, organization expenses, casualty insurance and omissions. The Commission has taken up this question and has discussed it in detail in several previous decisions, especial reference being here made to *State Journal Printing Co. et al. v. Madison Gas and El. Co.* 4 W. R. C. R. 501, 540–546. There have been brought to our attention no conditions or circumstances connected with the original construction and subsequent extension and operation of the plant here in question which would convince us that the 12 per cent allowance should not stand.

STORES AND SUPPLIES.

This group is valued at $2,840, cost new and present value, and covers stock on hand, such as pipe, pipe fittings, valves, meters, etc., but does not include coal and oil.

PAVING.

It appears from the investigation of the staff that the value of the paving work actually done by the company if covered by an allowance of $100. This represents the cost of cutting through and replacing paving which cost was actually incurred by the company. The question as to the inclusion of the value of the paving over the mains which has been laid since the mains were put down and which the company has never had to cut through and replace, has been discussed in several decisions of the Commission. No allowance will be made for paving which the company was not compelled to remove when laying its mains and services. *City of Ashland v. Ashland Water Co.* 4

W. R. C. R. 273, 307; *State Journal Printing Co. et al. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 554–555; *City of Ripon v. Ripon L. & W. Co.* 5 W. R. C. R. 1, 10; *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 492.

NON-OPERATING PROPERTY.

This group includes one Gordon and Maxwell Co. duplex pump and one portable fire-tube boiler with engine. The cost new of the group is $550, present value $287. It appears that these are items, which are used and useful in the operation of the plant and in extension work, and are properly included under "Tools, implements and machinery." They are, therefore, included in the valuation.

PREVIOUS VALUATION OF PROPERTY.

There was offered in evidence by the city the decision by a certain board of appraisers, which appraisement was dated Dec. 26, 1906. The board of appraisers was appointed under sec. 23, of ordinance 117, of the city of Manitowoc, and consisted of three disinterested persons, not residents of nor owners of property in Manitowoc county. The board was chosen, one (Simon Gillen) by the city of Manitowoc, one (Malcolm G. Jeffris) by the Manitowoc Water Works, and the third (Frederick E. Turneaure) by the two first named appraisers. This board determined upon the sum of $235,320.69 as the fair value of the utility. No detailed inventory or valuation was submitted, the sum above stated representing the total value of the plant as arrived at by the appraisers.

The company objected to the reception of the above appraisal as evidence of the value of the plant, the company claiming that the figure therein given was more of a compromise than a valuation.

The city also offered in evidence a proposal of the Manitowoc Water Works Company, dated Aug. 3, 1907, wherein the company offered to sell the plant to the city for the sum of $230,000. The company objected to the reception of this offer as evidence, declaring that the offer was made as the result of local agitation and out of a desire on the part of the company to bring an end to political factional fighting and to settle the disputes, including litigation over hydrant rental. The operating manager of the company testified that the offer was not to be taken in any sense as the company's idea of the true and fair value of the property, as the offer was never expected to be accepted.

GOING VALUE.

No new features have arisen in this proceeding in regard to the matter of the determination of the going value of the plant. It is conceded by the city that such an element of value exists and should be considered, but the contention of .the city in this instance is, that no actual value of this character can now be assigned to the Manitowoc Water Works. The company, on the other hand, claims and seeks to establish that a large going value must be added to the valuation of the physical property before the true value of the plant may be correctly ascertained.

The determination of the character and amount of this going value in this case involves the analysis of all the facts bearing on the original cost of the plant and subsequent additions and extensions to the property, the records of earnings and expenses since the earliest period for which such records are available, the conditions under which the plant has operated, and other factors.

It seems best to reproduce herein the arguments of the city and company, together with the tabulations and computations submitted, before proceeding to any independent analysis of the facts as submitted and as investigation has discovered them.

The city points out, among other things, that the plant was built and installed under an absolute guaranty of $6,500 per year for hydrant rental, and a certain installation of hydrants was specified. Additions to this original installation were to be made as provided in the ordinance, which states that extensions were not to be made except upon guaranty of income. The records show that the provisions of this ordinance were followed in ordering extensions and that the company made the extensions only when the guaranty was furnished or when hydrants were placed by the city.

The city submits that at the time the original water works ordinance was passed the city contemplated the purchase of the plant and provided a method for such purchase in the ordinance, and that it is not to be assumed that either the city or the company anticipated that when making such purchase the city should pay any considerable sum because the city was a patron of the plant or because the residents of the city were patrons of the company. The consumers provided and paid for their own connections to the mains, the company furnishing only the mains in the streets. It hardly seems equitable, the city contends, in view of these facts, that the city should be compelled to pay to the company a large sum of money because the city and its citizens are users of the service and paying revenue to the company.

It is also pointed out by the city that the saturation of territory in Manitowoc is good, there being 7.9 inhabitants per service, which is slightly below the average for similar plants in Wisconsin, and that the increase in population during the last ten years has been less than 10 per cent. From these facts the city argues that the earnings of the plant are as large as it can reasonably be expected they will be for some years in the future. The city further asserts that the plant needs a new engine and new pumps, a new force main, an additional river crossing and certain extensions. These additions to the equipment of the plant will bring no material increase in income, but will increase the investment. Considering these facts and others, the city claims that no considerable sum should, in fairness, be added to cover the intangible element going value.

The company, on the other hand, contends that the Commission's powers, authority and duty in proceedings of this character are no other or different than the authority, powers and duty of a court under condemnation proceedings. The Commission, the company asserts, in this respect sits as a judicial body, to arbitrate the value of the plant in question, and the Commission is called upon to decide: What is a fair value of the plant now? The elements that enter into the determination of the value of the plant, are, in the company's belief: What would it cost to reproduce the plant; what is it earning, and what is a fair sum to fix upon by reason of the fact that it has an established, remunerative, valuable, going business; that is, its going value added to its physical value?

The company asserts that it has been conclusively demonstrated that from the time the plant was built and began operations and for a period of about ten years, it was a losing venture. Further, the company claims that the records of receipts and expenditures available do not measure in any way the value of the time, the trouble, the thought, the energy and effort devoted to these works during the early period of their development and operation.

The going value of the plant is defined by the company as the difference between the fair market value of the whole, and the physical value of the property. The fair market value, the company asserts, is quite closely represented by the earning capacity, and this the company finds to be about $350,000, since the plant is today earning 7 per cent on $350,000. The method, of course, assumes that the present rates of the company are not excessive and unreasonable and that the present income will continue. The contention of the company is that the rates are at present reasonable and do not produce an unreasonably high return upon the investment, and further the company calls attention to the fact that the community in which the plant is located and whose needs it serves is prosperous and growing, and every indication points to a growing business and a steadily increasing income.

RECORDS OF EARNINGS AND EXPENDITURES.

It will be seen from the statements set forth in the foregoing discussion that a careful investigation and analysis of the earnings and expenditures and growth of business of the plant will be necessary in order to present the facts required in the just consideration of the problems herein presented.

Three annual reports have been filed by the Manitowoc Water Works Company with this Commission under the requirements of the Public Utilities Law. An audit of the company's books and accounts has been made by the Commission's agents, which audit extends for a period of years prior to the reports filed with this Commission as above described. In connection with this proceeding there has also been submitted a statement showing the earnings and expenditures of the company since 1889, or very nearly covering the entire history of the plant's operation. It appears that the company first began to sell water about June 1, 1889. It further appears that the present owners came into active control and management about the year 1898.

The following tables III and IV present the earnings and expenses as submitted by the company:

TABLE III.

RECORD OF EARNINGS.

1889—1911.

Year ending Dec. 31.	Water rental.	Hydrant rental.	Service.	Meter account.	Interest.	Total.	Net income.
1889	$1,654 81	$1,083 33	....	....	....	$2,738 14	$214 17
1890	2,996 19	6,500 00	....	....	....	9,496 19	4,900 89
1891	4,093 90	6,540 00	....	....	....	10,633 90	5,528 28
1892	5.210 79	6.760 00	....	....	....	11,970 79	6.930 65
1893	4.725 61	7,140 00	....	....	....	11,865 61	6,829 09
1894	6,469 72	7,140 00	....	....	....	13.609 72	7,921 47
1895	6.915 52	7,140 00	....	....	....	14,055 52	7,772 29
1896	9.014 25	7,166 40	....	....	....	16.180 65	9.159 18
1897	11.343 76	6.907 00	....	....	....	18,250 76	10,483 12
1898	13.815 61	7 295 80	....	....	....	21,111 41	12.783 62
1899	16,646 49	7.472 74	$3,431 65	....	....	27,550 88	20,326 05
1900	18.806 61	7.684 63	127 05	....	....	26,618 29	15,860 38
1901	20,592 54	7.900 00	641 26	$322 33	....	29,456 13	16,639 41
1902	20,811 97	7.887 81	2,684 49	....	....	31,384 27	15,486 33
1903	19.745 07	8,021 71	2.215 51	....	....	29,982 29	13.047 39
1904	21,687 78	8.321 73	3,143 18	....	....	33,152 69	13,597 78
1905	24,266 84	8,460 00	2,846 67	....	....	35,573 51	14,364 63
1906	24 170 00	8.663 99	2,686 72	....	....	35,520 71	18,704 64
1907	25,234 01	8,841 44	1,700 05	....	$481 67	36,257 17	17,528 61
1908	26,089 54	9,018 47	2,486 96	....	....	37,594 97	21.098 92
1909	27,361 71	9,309 73	1,225 58	....	....	37,897 02	20,804 00
1910	31,475 65	9,382 36	1.273 07	....	....	42,131 08	25,434 90

TABLE IV.

RECORD OF EXPENDITURES, 1889—1911.

Year ending Dec. 31.	Fuel.	Power house expense.	Maintenance mains and hydrants.	Other maintenance items.	General* expense.	Miscellaneous expense.	Taxes.	Meter account.	Total.
1889....	$499 51	$130 94	$52 55	....	$1,840 97	....	....	....	$2,523 97
1890....	998 73	382 54	1,398 74	....	1.410 08	....	$405 21	....	4.595 30
1891....	1.049 41	1,329 31	717 21	....	1.387 63	....	622 06	....	5.105 62
1892....	1.628 77	328 79	343 05	....	2.015 01	....	724 52	....	5,040 14
1893....	1,750 00	339 30	353 05	....	2.068 58	....	525 59	....	5,036 52
1894....	1.900 00	369 30	383 05	....	2,483 66	....	552 24	....	5.688 25
1895....	2,026 67	337 23	246 44	....	3.127 42	....	545 47	....	6,283 23
1896....	2.347 33	373 78	256 44	....	3.552 95	....	487 37	....	7.021 47
1897....	2,200 00	407 23	356 44	....	3.897 58	....	906 39	....	7.767 64
1898....	2,100 00	457 23	456 44	....	4.222 66	....	1,081 46	....	8.317 79
1899....	1.435 71	455 91	587 04	....	3,687 43	....	1,058 74	....	7,224 83
1900....	1.493 55	442 56	110 90	....	7.155 90	....	1,555 00	....	10,757 91
1901...	1.686 05	452 12	230 73	....	8.980 47	....	1.467 35	....	12,816 72
1902....	1.937 44	161 05	152 46	....	10,622 14	....	1.548 87	$1,475 98	15,897 94
1903....	2.386 64	361 75	39 22	....	11,539 61	....	1,520 34	1,087 34	16,934 90
1904 ...	2 697 33	320 27	158 25	....	12,863 43	....	1.769 63	1,746 00	19,554 91
1905....	1.169 22	790 86	93 11	....	16,227 57	....	1,007 42	1,920 70	21,208 88
1906....	2.044 18	294 54	1,108 32	....	10,378 39	....	1,759 19	1,231 45	16,816 07
1907....	2.302 09	261 20	1,050 15	....	12,171 92	....	1,775 37	1,167 83	18,728 56
1908....	2.069 43	317 12	49 35	....	11,174 46	$6 30	2,879 29	....	16,496 05
1909....	1,921 28	1,003 75	306 51	$254 52	9 971 70	276 80	3,019 80	338 57	17,093 02
1910....	2,097 05	1,912 17	394 17	117 82	8,814 92	....	3,360 02	....	16,696 18

*Includes salaries.

The details of the general expense account are shown in the following table:

TABLE V.

GENERAL EXPENSES 1899-1910, INCLUSIVE.

Year	Salaries general manager and other officers.	Clerk.	All other salaries and labor.	Rent.	Teaming expense.	Telephone.	Light.	Legal.	Miscellaneous.	Total general.
1899	$1,125 00	$225 00	$1,320 00	$75 06	$125 35	$76 50	$13 25	$45 00	$682 27	$3,687 43
1900	4,250 00	300 00	1,550 00	100 08	154 10	72 00	21 00	111 18	597 54	7,155 90
1901	6,125 00	350 00	1,620 00	100 08	151 15	69 00	36 00	97 64	431 60	8,980 47
1902	7,500 00	390 00	1,629 98	100 08	175 30	81 71	36 00	247 74	461 33	10,622 14
1903	8,750 00	360 00	1,582 91	100 07	139 70	81 00	36 00	15 00	474 93	11,539 61
1904	9.625 00	415 00	1,932 83	226 68	144 00	81 25	40 89	....	397 78	12,863 43
1905	12,525 00	420 00	1,909 00	252 00	149 25	84 00	42 95	17 30	828 07	16.227 57
1906	6,900 00	435 00	1,780 00	252 00	160 50	88 76	56 03	....	696 10	10,378 39
1907	6,900 00	480 00	1,830 00	252 00	163 00	119 60	33 70	1,252 23	1,141 39	12,171 92
1908	7,050 00	500 00	2,006 50	270 00	210 85	127 60	37 89	....	971 72	11,174 56
1909	7,200 00	565 00	990 00	276 00	102 00	102 00	12 65	....	632 05	9.879 70
1910	7,200 00	600 00	....	276 00	....	100 00	2 56	....	401 58	8.580 14

An explanation accompanied the foregoing statement of general expenses in which the treasurer of the company discussed the items as follows:

"In connection with the analysis of general expenses, I desire to say that the salary of the manager and other general officers was not always paid in the year in which it was due, owing to the fact that the company did not have sufficient funds to pay. This accounts for the bunching in some years over others. In the column headed, 'All other salaries and labor,' the salaries of the engineers and outside men were charged in general expense up to July 1, 1909, when our accounts were changed in accordance with the request of your accounting department. The same explanation applies to column, 'Teaming expense;' this is now in 'Distribution.' In the 'Light' column, the lighting at the station is now in pumping expense. The 'Miscellaneous' column shows heavy in 1907 and 1908, owing to trouble with the city at that time and the appraisal of the plant for purchase by the city. Prior to July 1, 1909, many items went into this miscellaneous general expense which under your system of accounting are now charged into other accounts."

The yearly construction records have been examined and the following table VI is submitted:

TABLE VI.

EXTENSIONS AND IMPROVEMENTS.

1890	$605 06	1902	$1,829 35
1891	2,946 22	1903	3,861 73
1892	3,593 59	1904	3,163 47
1893	....	1905	2,622 31
1894	....	1906	3,647 54
1895	....	1907	5,163 40
1896	2,845 23	1908	8,391 22
1897	921 93	1909	3,772 61
1898	8,033 67	1910	5,137 57
1899	2,704 85		
1900	3,006 70	Total	$63,183 85
1901	937 40		

The foregoing tabulations relating to the earnings, expenditures, and additions and extensions of the plant summarize the facts submitted in regard to the operation and growth of the plant since its original construction. This information constitutes the basis upon which both the city and the company constructed certain computations in regard to the going value of the plant. These computations are reproduced in tables VII and VIII, which follow:

TABLE VII.

CITY'S STATEMENT OF VALUE OF PLANT.

Year.	Value of plant first of year.		Additions during year.	Depreciation.	Interest and profit		Net receipts for year.	Val. of plant end of year.	
	6% basis	7% basis			6% basis.	7% basis.		6% bas.	7% bas.
*1899...	$150,000	$150,000	....	....	$5,250 00	$6,125 00	$2,922 50	$152,328	$153,203
1890....	152,328	153,203	$605 06	....	9,157 83	10,745 39	4,900 89	157,190	159,653
1891....	157,190	159,653	2,946 22	....	9,519 79	11,278 83	5,528 28	164,128	168,350
1892....	164,128	168,350	3,593 59	....	9,955 49	11,910 28	6,930 65	170,746	176,887
1893....	170,746	176,887	....	$552	10,214 76	12,382 09	6,829 09	174,714	182,992
1894....	174,714	182,992	....	1,000	10,482 84	12,809 44	7,921 47	178,275	188,880
1895....	178,275	188,880	....	1,000	10,696 50	13,221 60	7,772 29	182,199	195,329
1896....	182,199	195,329	2,845 23	1,000	11,017 30	13,772 61	9,159 18	187,902	203,788
1897....	187,902	203,788	921 93	1,000	11,301 78	14,297 43	10,483 12	190,643	209,524
1898....	190,643	209,524	8,033 67	1,000	11,679 59	14,947 86	12,793 65	198,563	220,712
1899....	198,563	220,712	2,704 85	1,000	11,994 93	15,544 51	20,326 05	193,937	219,635
1900....	193,937	219,635	3,006 70	1,000	11,726 42	15,449 68	16,610 38	193,060	222,481
1901....	193,060	222,481	937 40	1,000	11,611 72	15,606 48	19,264 41	187,345	220,760
1902....	187,345	220,760	1,829 35	1,000	11,295 58	15,517 23	19,486 33	181,984	219,620
1903....	181,984	219,620	3,861 73	1,000	11,034 89	15,508 56	18,297 39	179,583	221,693
1904....	179,583	221,693	3,163 47	1,000	10,869 88	15,629 23	19,522 79	175,094	221,963
1905....	175,094	221,963	2,622 31	1,000	10,584 31	15,629 19	23,389 63	165,911	217,825
1906....	165,911	217,825	3,647 54	1,000	10,064 09	15,375 41	22,104 64	158,518	215,743
1907....	158,518	215,743	5,163 40	1,000	9,526 57	15,282 73	20,928 61	153,279	216,261
1908....	153,279	216,261	8,391 22	1,000	9,448 48	15,431 96	24,648 92	147,470	216,435
1909....	147,470	216,435	3,722 61	1,000	8,959 88	15,280 74	24,504 00	136,648	211,934
1910....	136,648	211,934	5,137 57	1,000	8,353 01	15,015 19	29,134 90	122,004	203,952

* Last six months of 1899.

TABLE VIII.

COMPANY'S STATEMENT OF VALUE OF PLANT—7 PER CENT BASIS.

Year beginning Jan. 1.	Value of plant first of year.	Additions during year.	Annual depreciation. ¼ of 1%	Interest and profit 7%.	Net receipts during year.	Value of plant end of year.
1889................	$178,563	....	$893	$12,499	$214	$191.741
1890................	191,741	$605	890	13,443	4,901	201,778
1891................	201,778	2,946	894	14,227	5,528	214,317
1892................	214,317	3,594	906	15.128	6,931	227,014
1893................	227.014	....	911	15,891	6,829	236,987
1894................	236,987	....	906	16,589	7,921	246,561
1895................	246,561	....	902	17,259	7.772	256,950
1896................	256,950	2,845	904	18,086	9,159	269,626
1897................	269,626	922	909	18.906	10,483	279,880
1898................	279.880	8.034	927	19,873	12,794	295,920
1899................	295,220	2.705	949	20,809	20,326	300,057
1900................	300,057	3,0 7	959	21,109	15,880	309,272
1901................	309,272	937	964	21,681	16,639	316.215
1902................	316,215	1,829	966	22,199	15,486	325,723
1903................	325,723	3,862	975	22,936	13,047	340,449
1904................	340,449	3,163	988	23,942	13,598	354,944
1905................	354,944	2,622	997	24,937	14.365	369,135
1906................	369,135	3 648	1.008	25,967	18.705	381,053
1907................	381,053	5,163	1,025	26,854	17,529	396,566
1908................	396,566	8,391	1,054	28,053	21,099	412.965
1909................	412,965	3.773	1,079	29,040	20,804	426,053
1910................	426,053	5,138	1,096	30,003	25,435	436,855

It will be noted that on a 7 per cent rate of return basis the city arrives at a value of the plant on Jan. 1, 1911, of $203,952, while the company's computations show a value at the same date of $436,855. Since the going value may roughly be taken as the excess of the value arrived at by the above method over the value of the physical property on the same date, it is apparent that the city's statement shows no going value, while the company's statement shows a going value of over $200,000. This great difference in results obtained by the two computations is due to several causes, chief among which is the disagreement as to the original value of the plant.

ORIGINAL COST.

The city contends that $150,000 represents quite closely the actual original cost of the plant, while the company seeks to establish $178,563 as the amount more nearly representing the actual cost.

The city arrives at its figure of $150,000 by the following estimate;

Engineer's estimate of cost of reproduction, Jan. 1, 1911..			$248,999 00
Deduct:	Additions	$63,840 85	
	Stores and supplies	2,840 00	
	Paving	6,380 00	
	Increase in land value	5,460 00	
			77,563 85
			$171,435 15

This total is then reduced to $150,000 by the city because of alleged lower costs of labor and material at the time of original construction. The company arrives at the original cost figure of $178,563 given in its statement of the value of the plant by deducting from the reproduction cost ($248,999) the extensions and improvements ($63,184), the increase in land value ($5,000) and supplies on hand, exclusive of coal ($2,352). The company objects strongly to the further deduction of approximately $21,000 made by the city, and contends that there is no basis of fact upon which to base this arbitrary amount.

It appears from the testimony that when the present owner took over the plant there was a mortgage indebtedness of $200,000 against the property. The last annual report of the company (June 30, 1910) shows a mortgage indebtedness of $200,000 and common stock to the amount of $200,000, issued and outstanding. The mortgage against the property in existence at the time of the taking over of the property by the present owners, or $200,000, was refunded at that time and this refunding mortgage is the present mortgage on the property.

The treasurer of the company testified that to his belief and knowledge it was the customary method of financing water works concerns at the time this plant was built, to issue bonds for practically the cost of the plant if this could be done, that sometimes the immediate revenues were not sufficient to carry on the business, and that it was necesary to put in additional money; that such bonds were usually sold at a discount.

From the information presented at the hearings, it appears that the trust deed which was first issued upon the plant provided for the issuance of $200,000 of bonds, that $165,000 were actually issued at that time and the remaining $35,000 later, between the date of the original construction and the transfer of the property to the present owners, which was about 1898 or 1899.

In view of the facts so far brought to our attention, and in view of careful analysis of the value of the present equipment of the plant and the additions and extensions with the view of determining the value of the original construction, we are inclined to the belief that a sum of approximately $170,000 represents as fair and reasonable an estimate of the original cost as we are able to make at this time.

ADDITIONS AND EXTENSIONS.

The additions to the plant, year by year, as shown in table VI, appear to have been accepted by both sides in their respective estimates. It was explained by the treasurer of the company that these amounts had been taken from the books of the company, that prior to 1899 the records are not complete and it had been necessary to estimate the amount of extensions and additions to property prior to that date. The records showed the amount of work done and the character of this work and the cost had been derived by using the unit prices used by the staff in the tentative valuation. A tabulation was submitted showing the location, size and length of all mains laid during the period 1890 to 1911, inclusive, and the number of hydrants placed each year. There had been included in the estimate also the cost of a coal shed and a boiler room, but a number of smaller items, such as coal or wood used in construction, had not been considered nor had the usual allowance for engineering, superintendence, interest during construction, contingencies, etc., been made.

DEPRECIATION.

In the statement submitted by the city and reproduced herein as table VII, the annual allowance for depreciation was taken as $1,000 each year through the history of the plant, with the exception of one year where it was reduced to $552 and the first four years wherein nothing was allowed. The city has, in other words, distributed the difference between the cost of reproduction and present value as given by the staff, equally over the period of operation of the plant.

The company has computed the annual allowance for depreciation as equal to one-half of one per cent on the value of the physical property each year.

The question of depreciation in connection with computations of the kind under consideration here, has been discussed by the Commission in its decision *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 501–503. Referring therein to a method of distributing the depreciation, the same as followed by the city in this case, the decision reads:

> "To distribute this total depreciation over the twenty-four years of the plant's existence would, of course, be wrong in both theory and practice. Such a method of distributing the depreciation would be reasonable only under the assumption that the plant had been originally installed as it now stands. As a matter of fact, however, the plant has grown in value each year, due to additions and extensions, and the depreciation has, therefore, increased with the growth of the plant, smaller at first, and larger each year as the depreciable property became larger. Again, in the case of a plant as old as the one involved herein, some parts of the system have not remained throughout the plant's existence, but have depreciated to such an extent as to require replacement."

These conclusions apply with equal force to the case before us.

Composite life computations of the property of the Manitowoc Water Works Company show that under the 4 per cent sinking fund method, the annual depreciation on total property will be at about an annual rate of one-half of one per cent or less; under a 2 per cent sinking fund method the rate will be one per cent per annum or below this figure. The Commission has dealt very fully with the question of depreciation in previous decisions, and especially as regards water works properties, and the discussion need not be repeated herein. See *Hill et al. v. Antigo Water Co.* 3 W. R. C. R. 623, 643, and *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 502, 503.

INTEREST AND PROFIT, AND NET RECEIPTS.

It will be noted that in the statement submitted by the city, table VII, rates of both 6 and 7 per cent were used in computing the annual allowance for interest and profit. The company in its computations used only the 7 per cent basis. In view of the complete discussion of this question which has appeared in several previous decisions of the Commission, we will attempt no repetition of the matter herein. Reference is made to *State Journal Printing Co. et al. v. Madison Gas and El. Co.* 4 W. R. C. R. 501, 626, 633, also *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 505, 507.

The present bonded indebtedness of the company is $200,000, and these bonds bear interest at 5 per cent annually. No floating indebtedness is reported. No facts were presented showing even the approximate market value of these bonds, but from the situation generally it hardly seems probable that they would sell at par. At any rate, this is almost certain to be the situation if the bonds were increased in amount so as to cover the entire value of the plant.

> "The profits simply consist of what is left after all other claims have been satisfied. They form a surplus over and above the expenses of operation or production, and constitute that part of the income which goes to those who carry on the business." *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 506.

It is the contention of the city that the management in this instance has taken its profits out of the business, in large part at least, in the form of salaries. The effect of this view upon computations to determine the value of the plant is clear. The city has considered $3,500 per annum as adequate compensation for the management of the plant and has added the remaining part of the salaries of general officers to the net receipts, year by year. The company, in its computations, makes no deduction from operating expenses in this manner and, therefore, its computations show smaller net receipts. This difference in treatment in some measure explains the wide discrepancy between the results obtained by the city and the company in their statements of the present value of plant.

A detailed statement of the general expenses of the company was submitted and is shown in table V. This statement covers the period during which the present management has been in control of the plant. The second column in that statement shows the salaries paid to the general officers of the plant and shows this amount to range from $1,125 in 1899 to as high as $12,525 in 1905. The distribution of general officers' salaries is indicated by the statement of these expenses for 1904 as shown by the audit made by the Commission's agents. The salaries paid during that year, as shown by the vouchers, was as follows:

President	$3,000
Secretary and manager	4,500
Treasurer	3,000
Total	$10,500

In order to afford a comparison with similar plants in the state, the following table has been prepared. The plants included are similar in size to the Manitowoc plant, and several are operated by the management which controls the Manitowoc plant. These plants were all privately owned June 30, 1910, and were not operated in connection with any other utility in the same community.

TABLE IX.

RATIO OF EXECUTIVE SALARIES TO TOTAL OPERATING EXPENSES.

NOT INCLUDING TAXES AND DEPRECIATION.

Year ending June 30, 1910.

City.	Total expenses, excluding taxes and depreciation.	Salaries of general officers.	Ratio (approx.)
Antigo	$7,737 08	$2,472 97	31.9%
Appleton	16,619 92	1,800 00	10.8
Ashland	19,076 83	4,549 79	23.8
Fond du Lac	22,711 20	3,500 00	15.4
Green Bay	18,858 50	2,450 00	13.0
Merrill	12,572 16	1,631 46	13.0
Oshkosh	19,760 13	3,833 35	19.4
Racine	33,194 04	11,686 48	35.2
Janesville	18,779 50	7.539 95	40.0
Marinette	17,665 95	3,863 25	21.9
Average			22.4
Manitowoc	13,414 29	7,200 00	53.5

It appears from the foregoing tabulation that the ratio for Manitowoc is over twice as large as the average ratio for the other plants included in the list. It may also be stated that the average above shown is higher than similar average ratios for combined plants and for gas and electric utilities.

In order to show the conditions as regards the ratio of salaries to total operating expenses throughout the history of the operation of the plant under the present management, table X has been prepared and is shown on the following page.

This tabulated statement shows that since the first year the ratio has never been lower than 40.7 per cent and has reached 64.0 per cent. The latter high ratio noted may be explained, however, by the fact that salaries were not always paid in the year they were due, but were sometimes deferred for a year or for several years. The average is, however, 49.1 per cent for the entire period covered.

TABLE X.

RATIO OF EXECUTIVE SALARIES TO TOTAL OPERATING EXPENSES.

NOT INCLUDING TAXES AND DEPRECIATION.

Year.	Total operating expenses excluding taxes and depreciation.	Salaries of general officers.	Ratio (approximated.)
1899	$6,166 09	$1,125 00	18.3%
1900	9,202 91	4,250 00	46.1
1901	11,349 37	6,125 00	54.0
1902	14,349 07	7,500 00	52.2
1903	15,414 56	8,750 00	56.8
1904	17,785 28	9,625 00	54.1
1905	19,601 46	12,525 00	64.0
1906	15,056 88	6,900 00	45.8
1907	16,953 19	6,900 00	40.7
1908	13,616 76	7,050 00	51.7
1909	14,073 22	7,200 00	51.1
1910	13,336 16	7,200 00	54.6
Average			49.1%

Using 25 per cent, which is slightly above the average shown in table IX for similar plants, we would have about $3,334 as the allowance for executive salaries for the year 1910. In view of these facts it does not appear that the estimate of $3,500 per annum used by the city in its computations as a sufficient allowance for such management costs is unreasonable.

In tables XI and XII, which follow, some computations of the earning value of the company are presented. In table XI the original cost of the plant in 1890 has been taken as $170,000. The additions are as reported by the company and as used by both the city and the company in their respective computations. Depreciation has been computed at 1 per cent on the average value of the physical property for each year. Interest and profit are taken at 6 per cent on the average earning value for each year. The earning value at the close of 1910 is found to be about $231,557, or about $6,000 in excess of the present value of the physical property on the same date.

In table XII the computations are started about the date of the transfer of the property to the present owners. Allowing interest and profit at an annual rate of 7 per cent in this computation, we arrive at a value of $227,334 at the close of 1910, or about $2,300 above the present value of physical property, not including paving not cut through and replaced by the company. Reference is here made to the discussion *In re Fond du Lac Water Co.* 5 W. R. C. R. 482, 505, 508–520, 521. See also

Hill v. Antigo Water Co. 3 W. R. C. R. 623; *In re Menominee & Marinette Light & Traction Co.* 3 W. R. C. R. 778; *Payne v. Wis. Tel. Co.* 4 W. R. C. R. 1; *State Journal Prtg. Co. v. Madison Gas and El. Co.* 4 W. R. C. R. 501.

TABLE XI.

EARNING VALUE COMPUTATION.

Year.	Cost at beginning of year	Additions during year.	Depreciation 1%	Interest and profit 6%	Total foregoing.	Net earnings.	Value at close of year.
1890....	$170,000	$605	$1,797	$10,218	$182,619	$4,901	$177,718
1891....	177,718	2,946	1,815	10,751	193,230	5.528	187,702
1892....	187,702	3,594	1,848	11,370	204,514	6,931	197,583
1893....	197,583	....	1,865	11,855	211,303	6,829	204,474
1894....	204,474	....	1,865	12,268	218,607	7,921	210,686
1895....	210,686	....	1,865	12,641	225,192	7,772	217,420
1896....	217,420	2,845	1,880	13.130	235,275	9,159	226,116
1897....	226,116	922	1,899	13,595	242,532	10,483	232,049
1898....	232,049	8,034	1,944	14,164	256,191	12,794	243,397
1899....	243,397	2,705	1,997	14.685	262,784	20,326	242.458
1900....	242,458	3,007	2,026	14,338	262,129	16,610	245,519
1901....	245.519	937	2,046	14,759	263,261	19,264	243,997
1902....	243,997	1,829	2,059	14,694	262,572	19,486	243.093
1903....	243,093	3,862	2,088	14,701	263,744	18,297	245,447
1904....	245,447	3,163	2,123	14,822	265,555	19,723	245,832
1905....	245,832	2,622	2,152	14,829	265,435	23,390	242,045
1906....	242,045	3,648	2,183	14,632	262,508	22,105	240,403
1907....	240,403	5,163	2,227	14,579	262,372	20,929	241,443
1908....	241,443	8,391	2,295	14,738	266,867	24,649	242,218
1909....	242,218	3,773	2,356	14,646	262,993	24,504	238,489
1910....	238,489	5,138	2,401	14,464	260,492	29,135	231,357

TABLE XII

EARNING VALUE COMPUTATION.

Year.	Cost at beginning of year.	Additions during year.	Depreciation 1%	Interest and profit 7%	Total foregoing.	Net earnings.	Value at close of year.
1898	210,000	8,034	1,944	14,981	234,959	12,794	222,165
1899	222,165	2,705	1,997	15,646	242,513	20,326	222,187
1900	222.187	3,007	2,026	15,658	242,878	16,610	226,268
1901	226,268	937	2,046	15,872	245,123	19,264	225,859
1902	225,859	1,829	2,059	15,874	245,621	19,486	226,135
1903	226,135	3,862	2,088	15,965	248,050	18,297	229,753
1904	229,753	3,163	2,123	16,193	251,231	19,723	231,508
1905	231,508	2,622	2,152	16,297	252,579	23,390	229,189
1906	229,189	3,648	2,183	16,171	251,191	22,105	229,086
1907	229,086	5,163	2,227	16,217	252,693	20,929	231,764
1908	231,764	8,391	2,295	16,517	258,967	24,649	234,318
1909	234,318	3,773	2,356	16,534	256,981	24,504	232,477
1910	232,477	5,138	2,401	16,453	256,469	29,135	227,334

TABLE XIII.

RECORD OF REVENUES AND EXPENSES.

Showing net operating revenue and rate of return in per cent of plant investment. Plant investment each year obtained by deducting additions each year from staff's cost of reproduction less paving not cut through and replaced. General expenses for each year as given below are as obtained after deducting all executive salaries in excess of $3,500 per year.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.
OPERATING REVENUES:											
Water rental	$18,806 61	$20,592 54	$20,811 97	$19,745 07	$21,687 78	$24,266 84	$24,170 00	$25,234 01	$26,089 54	$27,361 71	$31,475 65
Hydrant rental	7,684 63	7,900 00	7,887 81	8,021 71	8,321 73	8,460 00	8,663 99	8,841 44	9,018 47	9,309 73	9,382 36
Services	227 05	641 26	2,684 49	2,215 51	3,143 18	2,846 67	2,686 72	1,700 05	2,486 96	1,225 58	1,273 07
Miscellaneous	....	322 33	....	....	....	....	....	481 67	....	....	....
Total operating revenues	$26,618 29	$29,456 13	$31,384 27	$29,982 29	$33,152 69	$35,573 51	$35,520 71	$36,257 17	$37,594 97	$37,897 02	$42,131 08
OPERATING EXPENSES:											
Power house expense	$389 01	$406 17	$122 39	$334 58	$297 41	$170 94	$252 87	$213 19	$247 14	$942 19	$1,630 15
Fuel	1,493 55	1,686 05	1,937 44	2,386 64	2,697 33	1,169 22	2,044 18	2,302 09	2,069 43	1,921 28	2,097 08
Oil and waste	53 55	45 95	38 66	27 17	22 86	19 92	41 67	48 01	69 98	61 65	121 20
Distribution expense	....	....	....	....	....	....	....	....	....	306 51	394 17
Maintenance of mains	110 90	230 73	152 46	39 22	158 25	93 11	1,108 32	1,050 15	49 35	244 52	89 44
Meter expense	....	....	1,475 98	1,087 34	1,746 00	1,920 70	1,231 45	1,167 83	....	338 57	....
Buildings and grounds—maint.	....	....	....	....	....	....	....	....	....	10 00	28 38
Steam plant—maint.	....	....	....	....	....	....	....	....	....	....	160 82
General expense	6,405 90	6,255 47	6,622 14	6,289 61	6,738 43	7,202 57	6,978 39	8,771 92	7,624 56	6,456 50	4,880 14
Undistributed expense	....	....	....	....	....	....	....	....	6 30	92 00	234 78
Total above items	$8,452 91	$8,624 37	$10,349 07	$10 164 56	$11,660 28	$10,576 46	$11,656 88	$13,553 19	$10,066 76	$10,373 22	$9,636 16
Taxes	1,555 00	1,467 35	1,548 87	1,520 34	1,769 63	1,607 42	1,759 19	1,775 37	2,879 29	3,019 80	3,360 02
Depreciation—1% on total property	2,010 86	2,040 93	2,050 30	2,068 59	2,107 21	2,138 84	2,165 06	2,201 54	2,253 17	2,337 06	2,374 81
Total operating expense	$12,018 77	$12,132 65	$13,948 24	$13,753 49	$15,537 12	$14,322 72	$15,581 13	$17,530 10	$15,199 22	$15,730 10	$15,370 99
Net operating revenue	$14,599 52	$17,323 48	$17,436 03	$16,228 80	$16,615 57	$21,250 79	$19,939 58	$18,727 07	$22,395 75	$22,166 92	$26,760 09
Plant investment—first of year	$201,086 00	$204,093 00	$205,030 00	$206,859 00	$210,721 00	$213,884 00	$216 506 00	$220,154 00	$225,317 00	$233,708 00	$237,481 00
Rate of return on investment	7.3%	8.5%	8.5%	7.8%	7.9%	9.9%	9.2%	8.5%	9.9%	9.4%	11.3%

Table XIII, which follows the earning value computations, gives a comparative yearly statement of the earnings and expenses of the company from 1900 to 1910, inclusive, showing the approximate annual rate of return earned by the company on the value of its physical property.

WATER SUPPLY.

The company contends that a fair and reasonable value of its plant and property must include a considerable allowance for the value of its water supply. The company rests this claim chiefly on the contention that the company has the only developed source of ground water supply in the vicinity and that to secure an equally pure and satisfactory supply would necessitate either the construction of an expensive intake into the waters of Lake Michigan or the location, purchase and development of an equally good ground water supply. On these grounds the company contends for a large value for its water supply as distinct and separate from the physical property necessary in its utilization.

It appears that the present filter gallery was originally intended as the source of supply, but that it was early found to be inadequate. After the filter gallery was found to be insufficient as a source of supply, further attempts were made to locate a supply and more or less accidentally the present supply was discovered.

It was established that no ground water supply has as yet been secured in Manitowoc besides that owned by the company which would be adequate in all respects for a public water supply system. It has also been established that the cost of a fairly equivalent lake supply would be perhaps $50,000 or a larger amount.

A report made by Professor C. S. Slichter after investigation of the conditions in Manitowoc, describes the situation and presents his views as follows:

PROF. SLICHTER'S REPORT.

"There are three possible zones or deposits from which underground water may be expected to be obtained at Manitowoc, Wis.: (1) Shallow wells in the glacial drift; (2) wells drilled into the Niagara limestone underlying the drift; (3) deep wells into the Potsdam sandstone and other formations underlying the Niagara limestone. These will be briefly discussed in the reverse order.

Potsdam and Other Deep Supply.

"No satisfactory information is at hand concerning the possibility of supply from the deep sandstones. No well, as far as known, that has penetrated the Potsdam either at Manitowoc or the neighboring city of Two Rivers, has had the upper limestone and other measures cased off, so as to give information of the possibility of the quantity of water available from the rock. It is well known that unless the upper layers are cased off, no indication of the supply from the lower rock can be formed. At Rockford, Ill., one of the city wells into the Potsdam yielded only 70,000 gallons per day. After re-packing and properly re-casing this well the yield rose to 177,000 gallons per day. Many well known instances of this kind show that a supply from the Potsdam is not an impossibility. A conclusive test of the matter would be quite expensive, say $4,000 to $6,000, and a supply suitable for the city, even if found, would involve the construction of several wells at about this expense each. The quality of the Potsdam water would undoubtedly be excellent—not different from the Potsdam supply of Madison, Wis.

Niagara Limestone.

"Many wells at Manitowoc penetrate this zone. It is needless to discuss this supply, as the water is so hard as to be unusable for domestic purposes.

Glacial Drift.

"The Niagara limestone at Manitowoc is overlaid with about 60 feet of glacial drift—sand, clay, gravels, etc., in irregular deposits. The deposits and topography are unusually favorable for a water supply from this zone. The surface of the land rises gradually and fairly uniformly as we leave the shore of Lake Michigan, until an elevation of about 200 ft. above the lake is reached in a distance of five or six miles. This developes a drainage toward the lake. A part of this is in small surface streams. The rest of the drainage is underground in the sands and gravels of the drift material. Wherever this can be intercepted in sands or gravels, a supply of good water is obtained. For domestic use such wells are obtainable almost anywhere, the quantity obtained varying with the coarseness of the deposits. For a municipal supply the wells should be located in coarse sands and gravels. Such wells would have to be drilled or dug after a survey by test boring. There would be no difficulty in finding favorable locations after a reasonable amount of effort.

"Such a supply should not be taken from within the built up portion of the city, but on the outskirts to the south or west of the city. Reports made to me by a local well driller verify my conviction that deposits of good gravel are common and available over considerable areas. Gravel would not be found, however, in extensive strata, but in separate streaks and deposits of limited areas.

The Present Water Supply Wells.

"The present wells used for water supply are located on the lake shore at the base of a bluff of glacial drift. The so-called 'mother well' is the older of the two wells and is located west of the railroad track. It is a shallow dug well, extending into a gravel deposit found in the drift. The yield and capacity of this well is shown by the accompanying diagram which is a recovery or rising curve found by allowing the water in the well to rise to its normal level after stopping the pump for a limited time. From this curve it is determined that this well was furnishing, when pumping stopped, 480 gallons per minute. It also shows that the water was drawn down during pumping to about 2.6 feet below the normal or undisturbed level of the ground water.

"The yield of this well must be understood to be very satisfactory.

"The new well is located between the railroad track and the lake. The well is larger and is cased with concrete walls, but is probably of lower capacity than the old well. It drains its supply from the same source.

"From levels on file in your office, taken Nov. 23, 1907, it appears that the water in the wells is drawn down below lake level, and, on above date, the lake level was within 0.17′ of the level of the top of the mother well.

"It is undetermined what portion of the supply of these wells comes from the lake side, and what portion represents seepage from the lake. The lake is contaminated at this point, and if the wells draw upon that source, the location of the wells must be regarded as unfortunate.

Value of the Water Supply.

"The writer does not believe that a water supply taken from the glacial drift in a location similar to that at Manitowoc can be held to have any commercial value, unless the law recognizes the right to file upon such underflow waters and undertakes to protect the prior user against all other parties intercepting the same underflow. In this case the yield of the wells, amounting to about 900,000 gallons a day, or 3 acre-feet of water daily, totals about 1,100 acre-feet per annum. This amount of supply must be the underflow from 3,000 or 4,000 or 5,000 acres of land upon which the rain falls. To claim right and ownership in this water supply one must have a legal right to the same. In the present case (unless the major supply is from the lake) the owner of adjacent land could effectively cut off the supply. If title could be delivered to this supply against all other possible parties, the supply would have a recognized commercial value dependent upon the local market. In California a water right in favorable locations might be and sometimes is worth $100 a miner's inch, which equals $5,000 for a cubic foot per second or $2,500 for one acre-foot, or enough water to cover one acre with water one foot deep. There the high value is due to the limited amount of water available for use upon almost unlimited possible cultivated land areas. At Manitowoc, on the other hand, there is not an unlimited market for water. The demand is limited to the needs of a population of 15,000 people and the needs of the probable future population. In arriving at a price one would be willing to pay for a supply already developed, a number of facts would be considered. Among these would be:

"1. The quality of the supply. A contaminated supply would undoubtedly force a purchaser to appraise such a plant at less than its physical cost—at a depreciation or negative value limited only by the undesirability of the purchase.

"2. The possibility and cost of future extensions. If the capacity must soon be enlarged and a new or additional supply sought for, the existing plant does not possess the desirableness that would induce purchase at a good price.

"3. The desirability of the location of the supply compared with other possible locations. If good judgment was not shown where the initial location was made, the present value of a plant may be negative. If one should pay for good judgment initially exercised, he should also deduct for poor judgment.

"Applying these principles to the ground water supply at Manitowoc, I find:

"1. It is not known whether the present supply is in danger of contamination from the lake or not. The writer believes the source of the supply is chiefly from the land side, but this is capable of demonstration.

"2. Necessary extension of the present plant by the addition of wells to the south or west beyond the range of interference with present yield are possible. Preliminary surveys for this purpose ought not to cost over $1,500 or $2,000. The present wells ought not to be drawn upon any heavier than at present, as new wells in the immediate neighborhood would draw, in large part, upon the present supply and affect the yield of the present wells. I do not regard the present property of the company, as far as supply is concerned, to possess a material reserve for future needs.

"3. I do not regard the present location of the wells as ideal. However, the wells can be protected from contamination from the land side by the purchase of land at present vacant. The location may then be looked upon as fair, provided that the present draw-down during pumping leaves the wells free from lake contamination.

"Under all of these conditions, putting myself in the position of a purchaser of the plant, I should be willing to allow the owners of the wells a liberal amount equivalent to a generous estimate of the cost of surveys necessary to locate a good site suitable for a similar supply. Recognizing that the present supply is known, and has been (or may be) tested as to quality and amount, and that all anxiety for immediate needs is at rest, a bonus of from $3,000 to $6,000 would be a reasonable estimate of what I should be willing to pay on that behalf. To account for this amount, it may be explained that a survey to locate an equally good supply might cost $2,500 to $3,500. Add to this a liberal amount for the uncertainty and doubt as to expense, etc., that an actual source sets at rest compared to a contemplated plant (somewhat in the nature of insurance to cover risks), I should be willing to pay or allow, say, $1,000 to $2,000 additional for this purpose. The water supply itself I regard as having no commercial value, as already stated. The expense and trouble saved, however, gives a value that one is willing to pay for a tested-out location.

"To illustrate this point: In Madison, Wis., where the Potsdam sandstone may be reached anywhere, I should make no payment or allowance of either of the sorts proposed above, as no location can have any material advantage (as a source of water) over any other. I would also not recognize that the source of supply for the city of Madison had any commercial value, unless the city had made under law such filings and had such prior legal rights to the supply, as to make such rights of record, and generally recognized, and hence transferable and marketable."

Subsequent to the investigation by Professor Slichter and the submission of the above report, evidence was introduced by the company in regard to certain features discussed therein. Mr. William S. Shields, a civil engineer, who has made a specialty of water works designing and construction, testified that he had examined the Manitowoc conditions and in his opinion the water supply owned by the company has a value independent of the value of the physical property. Witness stated that it is difficult to estimate the money value to the city of the supply from a sanitary standpoint, that the present supply is particularly well adapted for domestic and public purposes, and that in his opinion the value should be measured by the cost of reproducing a supply of the same character. Witness was not certain where, in the immediate neighborhood, supply could be reproduced. He gave as the probable cost of locating such a supply the sum of $2,500. This amount, together with the cost of the site, of sinking the well and of the necessary machinery and equipment to bring the water to the present station, as $35,000 or more. He gave as his estimate of the cost of an intake 5,000 feet or more into the lake, not less than $50,000. Witness further believed that the present source of supply could be developed so as to double its present capacity. In view of these facts and others, witness gave as his estimate of the value of the water supply approximately $40,000.

Mr. H. E. Keeler, an owner, operator and constructor of water works systems, with an experience extending over twenty-five to twenty-eight years, testified that he had examined and was familiar with the conditions in Manitowoc. In the opinion of this witness the water supply in question would be worth more than $30,000 to $40,000 as a supply. When asked how he arrived at this value, witness stated that the successful operation of a water works system requires a supply of sanitary water which will be safe for the citizens who are to use it and which can be obtained only from where it can be found to the best advantage. The mere cost of developing the supply, digging the wells, connecting them to the plant, and so forth, witness stated, is only a part of the value of that element of safety which is an esential element to the successful operation of the plant. Witness believed he knew of no case where an adequate supply had been obtained from the shore in the case of water works along Lake Michigan, except at Manitowoc, and he looked upon the supply there discovered as an accident and a very lucky find. From his knowledge of the conditions in Manitowoc and vicinity, witness believed that if an equivalent ground water supply were discovered, the cost of its development and the greater cost of its operation as compared with the present supply would make the present supply very valuable to a prospective user.

This question of the value of the water supply of the company, together with the character of the water obtained, its source, possible contamination and other factors, such as its adequacy, have been made subjects of special investigation by the staff prior to and subsequent to the hearings in this proceeding. A test of the wells and a fire test have also been made under the direction and supervision of the staff. The facts and information obtained by these tests and by the investigations made are all of great importance and of special value in the determining of a reasonable value of the property of the company involved in this proceeding. For these reasons the report of the Commission's engineer is reproduced herein.

It has not been considered necessary to reproduce all of the diagrams or charts referred to in the report and for this reason they have largely been omitted. They are, however, a part of the records in this proceeding and as such are readily accessible to the public.

REPORT ON TEST OF MANITOWOC WATER WORKS PLANT AND WATER SUPPLY.

Submitted by Engineering Staff, June 14, 1911.

"This memorandum report, submitted by the engineering staff for the consideration of the Railroad Commission, includes results of investigations of the following matters:

"1. Fire stream test conducted by the Commission's engineering staff upon request of the city authorities on May 16, 1911. Under this head is also presented a summary of a fire stream test made by the city authorities on April 30, 1911.

"2. Results of test of yield of wells made on April 25, 1911, by Commission's staff.

"3. Investigation of source of well water supply.

"4. Results of water examinations by the state hygienic laboratory, made in co-operation with the Commission's staff.

"5. Investigation of the river intake.

"6. Conclusions as to adequacy of plant and value of water supply, based on foregoing investigations.

"1. *Fire Stream Test.* The test of the Manitowoc water works, which the Commission had been requested by the city authorities to make, was conducted by the engineering staff on Tuesday, May 16, 1911.

"The eight hydrants chosen by the special council committee with the approval of the water company and designated in a joint communication of the two parties to the Commission under date of May 2, 1911, were used in the test, except that' hydrant at corner of Chicago and 11th streets was used in place of one at Chicago and 9th streets, which was incorrectly listed in the communication. The plan followed was to put in service a total of eight streams from eight hydrants, beginning with four, followed by two after fifteen minutes and two after thirty minutes.

"The original water works franchise ordinance (No. 117) contains in sec. 7 three different specifications for test of the plant as follows:

"'Sec. 7. Said works shall be so constructed that they shall be able to furnish a plentiful supply of water to said city and its inhabitants for domestic, personal and manufacturing purposes, for the extinguishing of fires and conflagrations and other public and private uses and so that they shall be able at all times and without notice to supply for an indefinite period (with or without the aid of the pumping machinery) eight fire streams from any eight hydrants, each stream using three hundred feet of two and one-half inch hose, with one inch ring nozzle and said streams shall reach a vertical height of sixty feet in still air, and said grantees shall maintain at all times a pressure of water sufficient to give such streams, and said works shall be so constructed as also to be able, by direct pressure from the pumps (the connection with the standpipe being closed) to throw eight streams from eight hydrants, with the same hose and nozzle conditions, to the height of eighty feet, or to furnish four streams from any four hydrants, through four hundred feet of hose per stream, with one and one-quarter inch nozzles, under a pressure of one hundred pounds at the hydrants, so long as desired. And the said grantees shall, upon an alarm of fire, immediately apply said pumps, and shall furnish the maximum pressure above mentioned, within fifteen minutes after an alarm, if called for by the officer in command of the fire department of said city. Hydrants located west of Nineteenth street, and those located south of Marshall and west of Thirteenth street shall not be subjected to the test as herein required, until, in the future, additional pipe connections shall have been made which will allow the required test.

"'Sec. 8. The city may cause said works to be tested once in each year, the works to bear the same test hereinbefore provided.'

"The following table presents a comparison of data concerning the streams called for in above franchise requirements and the streams used in the recent test showing data obtained in fire stream test of May 16, 1911:

No. of streams[1]	Nozzle.	Hose length, feet.	Height in still air, feet.	Quantity of water discharged by each, gal. min.	Pressure at hydrant, sq. in.	Total quantity for all streams gal. min.
8.........	1" Ring.........	300	60	122	40	976
8.........	1" "	300	80	141	54	1,128
4.........	1¼" "	[2]400	71	266	100	1,064
4.........	1" Ring	100	107	168	[3]65	1,550
1.........	1⅛" Smooth......	100	104	266	70	
3.........	1⅛" Ring	100	98	204	60	

[1] First three represent franchise requirements. Second three represent test of May 16, 1911.

[2] Smooth nozzles assumed.

[3] Approximate average pressures observed at several hydrants, during recent test, prior to last quarter hour.

"A pressure recording gauge was connected to each hydrant in service throughout the test and to the water piping at the pumping station. A blue print copy of each pressure record, and blue prints from a tracing of all records and tracing of the records in two groups including the record at the plant are hereto attached.

"Referring to the chart showing the pressures at the hydrants where 1⅛" nozzles were used, it will be noted that the pressure record for gauge F, located at corner Buffalo and Tenth streets, is considerably lower than pressures obtained at the other hydrants. This was found upon inspection after the test to be due to the presence of a stone about 4½" in diameter and 1½" to 2" thick in inlet to the hydrant.

"The following table shows the elevation of hydrants using center of water cylinder of pumps at the station as datum, gauge pressures at hydrants and gauge pressures reduced to common datum. This drop in pressure represents the loss due to friction and draw on the system.

TABLE SHOWING DATA RELATING TO HYDRANT PRESSURES IN FIRE TEST.—*May 16, 1911.*

Location of hydrant.	Elevation with c. l. cylinder as datum —feet.	Average gauge pressure. lbs., sq. in.	Gauge pressure reduced to common datum. lbs., sq. in.	Drop in pressure between station and various hydrants, lbs., sq. in.	Size of nozzle.
Pumping station	1.0	80	80.5	....	....
Commercial & 7th	6.5	70	73.0	7.5	1¼" S.
South Water & 11th	2.0	68	69.0	11.5	1¼" R.
N. W. Cor. Wollmer & 16th	16.5	60	67.0	13.5	1¼" R.
Buffalo & 10th	12.0	48	53.0	27.5	1" R.
Commercial & 5th	2.5	70	71.0	9.5	1" R.
Chicago & 11th	16.0	66	73.0	7.5	1¼" R.
South Water & 13th	5.5	55	57.5	23.0	1" R.
S. E. Cor. Wollmer & 16th	17.0	60	67.5	13.0	1" R.

"Measurements of the rate of pumping were made by a pitometer inserted in the 16″ pressure main a short distance from the plant and several representative readings on the flow of water in the main reduced to gallons per minute, are compared in the following table, which also shows total rates of discharge of the fire streams in service and pumpage rate figured from stroke counter readings of the pump.

TABLE SHOWING QUANTITIES OF WATER PUMPED DURING FIRE TEST
May 16, 1911.

Time.	Pumping rate in gallons per minute by				Pumpage gallons per minute divided between	
	North pump.	South pump.	Both pumps.	Pitometer.	Fire streams.	Domestic, industrial waste, leakage, etc.
9:41	....	....	....	1.520	....	....
9:55	1.066	1,282	2,368	1.855	882	973
10:10	1.031	1,424	2,455	2,200	1,236	964
10:25	1,070	1,495	2,565	2,410	1,585	825
10:40	968	1,629	2,597	2,415	1,547	868
10:55	991	1,637	2,628	2,350	1,538	812
11:10	960	1,637	2,597	2,390	1,545	845
11:25	960	1,621	2,581	2,370	1,538	832
11:40	968	1,644	2,612	2,370	1,537	833
11:55	968	1,605	2,573	2,315	1,540	775
12:10	913	1,644	2,557	2,370	1,552	818
12:25	928	1,581	2,509	....	1,560	....
12:40	905	1,597	2,502	....	1,556	....
12:55	1,015	1,586	2,601	2,340	1,382	958
1:05	1,511	1,416	2.927	2,830	1,541	1,289
1:10	1,550	1,456	3,006	2,920	1,708	1,212
1:15	1,503	1,487	2,990	2,950	1,702	1,248

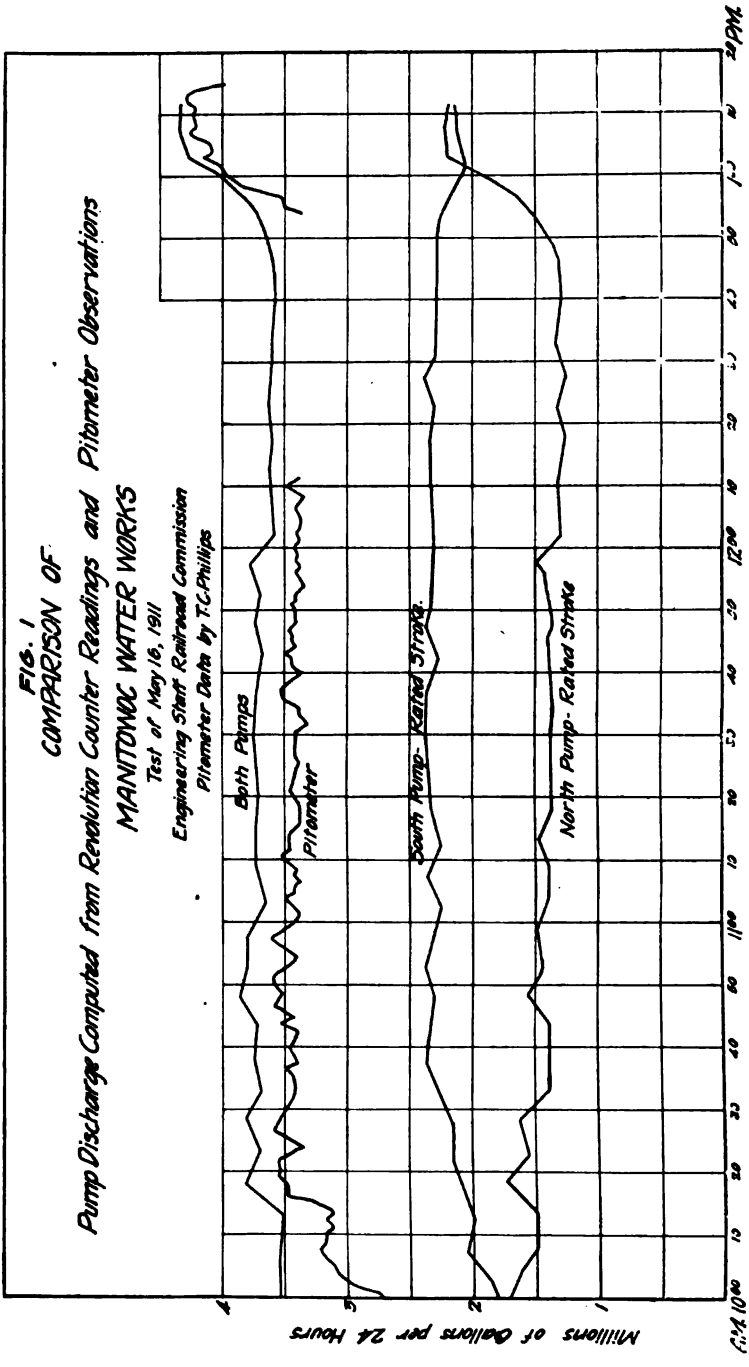


FIG. 1
COMPARISON OF
Pump Discharge Computed from Revolution Counter Readings and Pitometer Observations
MANITOWOC WATER WORKS
Test of May 16, 1911
Engineering Staff Railroad Commission
Pitometer Data by T. C. Phillips

"The attached diagram, called Fig. I., shows a comparison of the amount of water pumped as figured from revolution counter readings on the pump and amount actually pumped as indicated by the pitometer observations. From a study of this diagram the slippage of the pumps was found to be about 8 per cent.

TABLE SHOWING DOMESTIC AND INDUSTRIAL CONSUMPTION AND WASTE, ETC., IN GALLONS PER MINUTE FOR TEN DAYS PRIOR TO TEST.

Manitowoc standpipe (20x120)
Area hor. section 314.16 sq. ft.
Gal. per foot of depth -2350.
Gal. per lb. pressure. 5420

Date.	Time stop.	Time start.	Time minutes.	Pressure start. per sq. in.	Pressure close per sq. in.	Diff. of pressure per sq. in.	Gallons per min.
May 14...	12:05 p. m.	1:05 p. m.	60	49	40	9	811
May 13...	5:30 p. m.	6:40 p. m.	70	49	40	9	697
May 12...	8:15 a. m.	8:40 p. m.	25	45	40	5	1,070
May 11...	12:00 p. m.	12:40 p. m.	40	46	40	6	812
May 10...	12:05 p. m.	1:05 p. m.	60	48	40	8	720
May 9....	11:55 a. m.	12:45 p. m.	50	46	39	7	758
May 8....	12:00 m.	1:00 p. m.	60	47	40	7	630
May 7....	12:15 p. m.	1:30 p. m.	75	50	43	7	550
May 6....	1:45 p. m.	2:40 p. m.	55	49	40	9	885
May 5....	12:05 p. m.	1:05 p. m.	60	49	40	9	811

"The comparison of the last two tables shows that during fire stream test the water used for domestic and industrial purposes ranged from 775 gal. per minute at 11:55, to 1,289 gal. per minute at 1:05, and that for records during some ten days previous to fire test the consumption for same class of service ranged from 550 gal. per minute on May 7, between 12:15 and 1:30 p. m., to 1,070 gal. per minute on May 12, between 8:15 and 8:40 a. m. The wells were not pumped down to their lowest levels, at which their rate of production is greatest, at any time during the test, and the reservoir supply could have been conserved more than it was. The reservoir was first drawn upon at 11:15 a. m., at which time it was practically full, containing about 354,000 gallons in a depth of 21 feet. Only 123,000 gals., or a depth of 7.3 ft., had been used from the reservoir at 1:15 when the test was stopped.

"Attention may be called to the fact that during the test on May 16, 1911, more water per minute was thrown by the fire streams than is required under any test prescribed by the original franchise.

"The record of the former fire stream test (April 30, 1907) shows that two separate tests were made, one series including eight fire streams using 1″ nozzles and 300 ft. of hose, and the second series four fire streams from 1¼″ nozzles using 400 ft. of hose. The results of the test are shown in the following table:

FIRE STREAM TEST OF APRIL 30, 1907.

Location of hydrant.	Nozzle.*	Length of hose.	Average hydrant pressure lbs. sq. in.	Gal. min.	Total gal. min.
19th & Marshall	1"	300	75	166	....
16th & Clark	1"	300	72	162	....
14th & Marshall	1"	300	75	166	....
15th & Franklin	1"	300	88	180	....
7th & Chicago	1"	300	84	176	....
10th & Huron	1"	300	62	150	....
6th & Park	1"	300	69	159	....
Commercial & 5th	1"	300	84	176	1,325
15th & Franklin	1¼"	400	110	257	....
19th & Washington	1¼"	400	99	244	....
7th & Chicago	1¼"	400	116	263	....
10th & Huron	1¼"	400	86	226	990

* Ring nozzles assumed.

"2. *Test of Yield of Wells.* The method used was to pump the two wells simultaneously to practically their lowest levels, then to stop the pumps and take readings of the time and water levels in the wells. The data thus obtained, when put into a diagram or graphical form, constitutes what is termed a recovery curve. The slope of such curve at any point shows the rate of inflow of the water into the well at that moment. In connection with these tests of yield, observations were taken in a series of five well points, further reference to which will be found in item 3 of this report.

"Recovery curves for main wells are shown by accompanying diagrams. The recovery observations for these two wells were begun with the wells pumped as low as ordinarily practicable, or to about one foot above the bottom of the suction pipe. The tangents to the recovery curves for the wells have been drawn at the lower limits of the curves to represent the maximum rate of production. These rates applied to the areas of the water surfaces in the wells indicate yields of 733 gallons and 563 gallons per minute for the mother well and new well respectively. Their total combined yield of 1,296 gallons per minute is equivalent to 1,866,000 gallons per day.

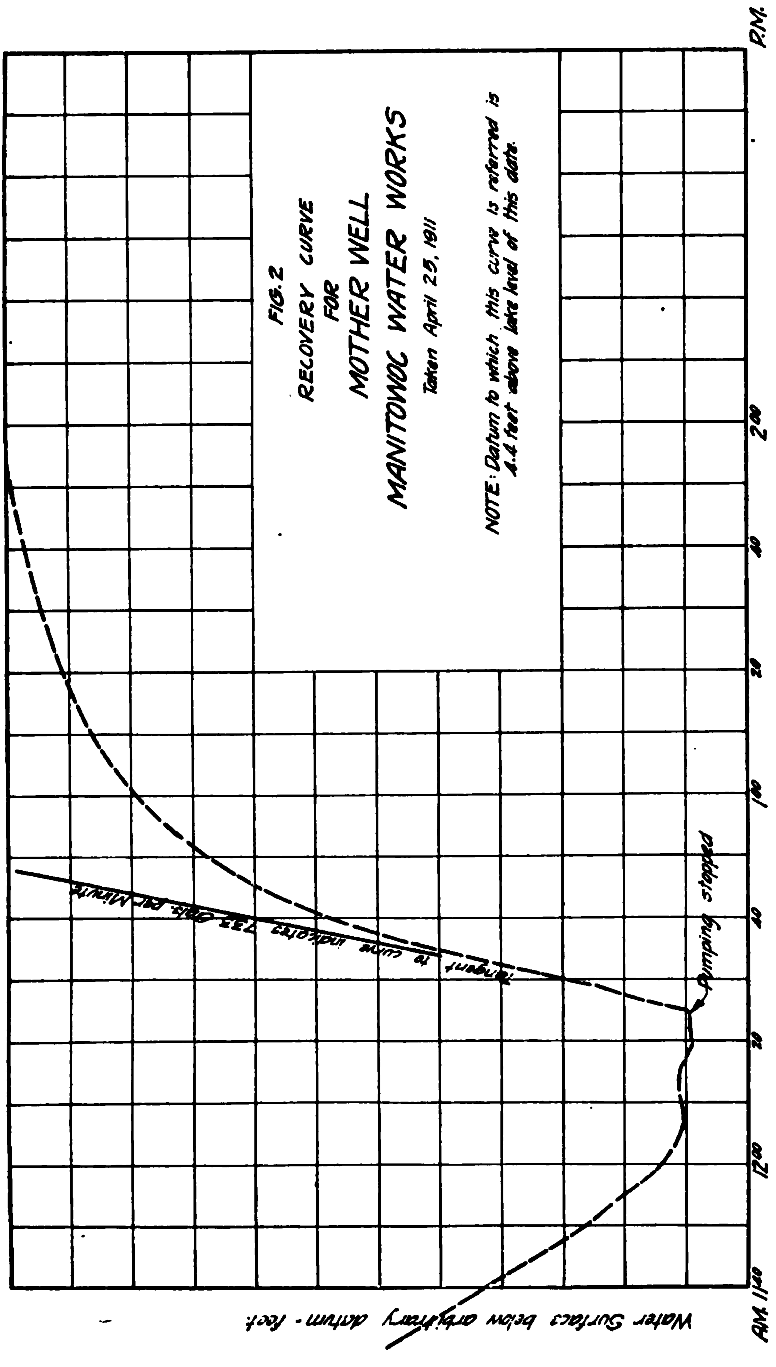


FIG. 2
RECOVERY CURVE
FOR
MOTHER WELL
MANITOWOC WATER WORKS
Taken April 25, 1911

NOTE: Datum to which this curve is referred is 4.4 feet above lake level of this date.

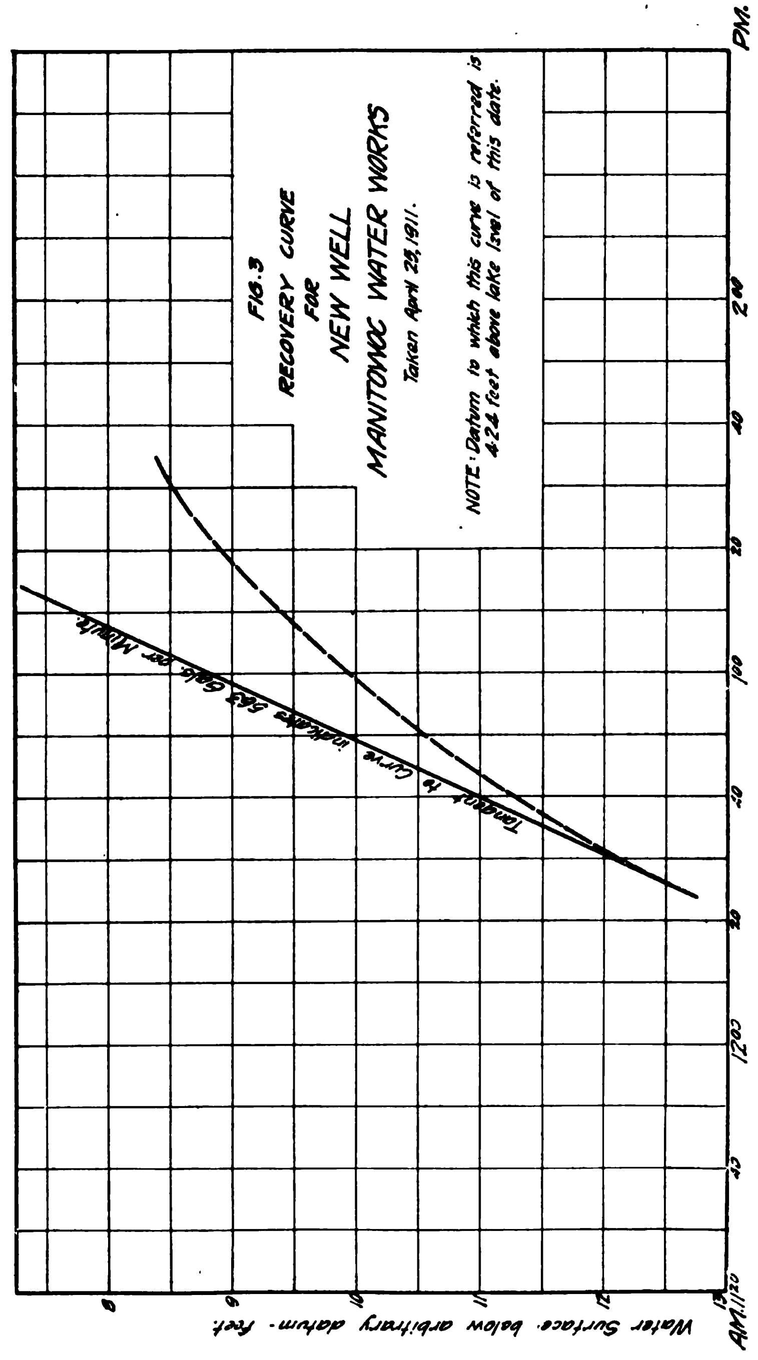


FIG. 3
RECOVERY CURVE
FOR
NEW WELL
MANITOWOC WATER WORKS
Taken April 28, 1911.

NOTE: Datum to which this curve is referred is 4.24 feet above lake level of this date.

"3. *Source of Well Water Supply.* In connection with the test of the yield of the wells an effort was made to gather information relative to the direction of the flow of water intercepted by the wells, that is, determine what proportion of the water supply comes in respectively as underflow from the westward and as inflow through the gravel from the eastward or lake side. Levels carefully taken on a former occasion had shown that the level of the water in the mother well, after a considerable period of rest, differed but slightly from that of the lake itself. Although springs are found on the higher ground to the westward, none whatever were found along the foot of the sand bluff adjacent to the company's land previous to sinking the 'mother well', which fact indicated a somewhat free outlet for the underflow into the lake. With a view of exploring the ground water levels and also of getting water temperatures as a guide in reaching conclusions as to the relative inflow from the two directions, a series of five 1¼″ drive points were sunk in the vicinity of the wells. The positions of these well points and also a graphical representation of the temperatures are shown on the accompanying diagram, which is self-explanatory. In connection with the observations of the drop in water levels in the well points as pumping proceeded and the recovery with cessation of pumping, the customary conditions were found to prevail as to the disturbance of ground water levels in the several directions noted. Temperatures observed on April 25 in the well points between the water's edge of the lake ranged from 56 deg. following a smooth curve of descent down through the values 48 deg., 38 deg., to 36 deg., in well points 'B,' 'C' and 'D,' respectively, included in the diagram.

"Temperatures in these same well points some three weeks later (May 16) had risen to 52.5 deg., 47.8 deg., and 46 deg., respectively. On both dates, however, the temperature of the water in the single well point west of the mother well remained practically constant, at 46 deg., which value lies within the probable normal temperature range for fairly deep ground waters (30 to 80 ft. deep) in this locality from the mean annual air temperature of about 45 deg. as a winter minimum to about 3 deg. above for the summer maximum.

"This comparative steadiness of temperature indicates a ground water inflow from the westward and the erratic movement of temperatures on the easterly side gives evidence of important disturbing influences in that direction. The comparatively scant depth of soil on the lakeward side would permit of considerable thermal effects from air and sun, but the chief disturbing influence is readily seen to be the lake itself, for the very low ground water temperature (36 deg.) can be accounted for in no other way. In the lack of corresponding observations taken in midwinter there is some doubt as to the actual minimum value, but it is believed that the values would probably be not far from 35 deg. as indicated by the broken line. In this connection it may be noted that winter temperatures of water observed by the Madison natural history survey in Lake Mendota at Madison were as follows on Feb. 6, 1909:

Depth.	Temperature.
At surface of water	32.5 deg. F.
18 in.	33.3 deg. F.
3 ft.	35.2 deg. F.
16 ft.	35.2 deg. F.
32 ft.	35.2 deg. F.
50 ft.	35.6 deg. F.

"The summer maximum is more difficult to estimate, although the long continued solar effect would account for the observed temperature of pumped water of 58 deg. or higher. A temperature of 42 deg. in the mother well as against 46 deg. in well point 'E,' and 36 deg. in point 'D' observed on April 25, can be accounted for on the assumption of an inflow of, say, three gallons of normal deep ground water at 46 deg., to, say, two gallons of lake water at 36 deg., the mother well being a mixing tank for the two kinds of water.

"4. *Results of Water Examinations.* In the following table are summarized the results of the bacteriological and chemical examination of samples of water taken from the two company wells and also from the lake and river, and the surface wells through the district to the westward. The following opinion is quoted from the letter of the state hygienic laboratory, transmitting these results to the Commission:

"'The results of the bacteriological and chemical analysis, together with temperature readings, indicate that the greater portion of the water supply is derived from inland sources. A portion of the supply undoubtedly comes from the lake. The quality of the water derived from the new and old wells is satisfactory, but the waters derived from the private wells are contaminated, at least during the rainy weather.'

WISCONSIN STATE HYGIENIC LABORATORY

REPORT OF BACTERIOLOGICAL EXAMINATION OF WATER.

Sample No.	DATE		Place obtained.	Temperature F.	Condition.	No. bacteria per c. c. in gelatin incubated at 22° C.	No. bacteria per c. c. growing at body temperature.	No. acid producing bacteria per c. c.	COLON BACT. IN	
	Received.	Collected.							1 c. c.	10 c. c.
				Degrees.						
9748....	5—17	5—16	Fog Horn Pier—Lake............	51	Polluted....................	2,000	20	1	Present.	Present.
9749....	5—17	5—16	917 Division St. Well............	43.5	Contaminated............	1,126	15	0	0	0
9750....	5—17	5—16	714 Hancock St. Well..........	44	Contaminated............	2,500	8	... .	....	....
9751....	5—17	5—16	Near mouth of creek. Lake....	51	Polluted....................	2,000	6	....	Present.	Present.
9752....	5—17	5—16	Manitowoc. Old well	47.4	O. K.......................	80	2	....	....	....
9753....	5—17	5—16	1710 S. 10th. Well................	42	No evidence of pollution.	500	7	1	....	....
9754....	5—17	5—16	1102 S. Green St. Well	41	Contaminated............	3,000	51	7	....	Present.
9755....	5—17	5—16	1519—10th St. Well.............	45.2	Contaminated............	2,400	5	1	....	....
9756....	5—17	5—16	Manitowoc—New well	41	O. K........................	40	1	....	....	....
9757....	5—17	5—16	Manitowoc. Lake Mich.........	51	Contaminated.....	1,500	16	2	....	Present.
0758....	5—17	5—16	Manitowoc. River..............	57	Polluted....................	4,500	181	1	Present.	Present.

REPORT OF THE CHEMICAL ANALYSIS.

Sample number.	Nitrogen as free ammonia.	Nitrogen as albumenoid amm.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.	Sulphates.	Iron.	Oxygen consumed.	Total solids.	Hardness.	Alkalinit.
9748..	....	....	....	....	3.6	......	......	....	171	169	118
9749..	....	....	....	....	6.4	......	......	....	1,298	378	195
9750..	....	....	....	....	23.0	......	......	....	655	348	317
9751..	....	....	....	....	11.5	......	......	....	170	145	117
9752..	....	....	....	....	8.0	......	......	....	264	172	134
9753..	....	....	....	....	140.0	......	......	....	1,856	372	228
9754..	....	....	....	....	174.0	......	......	....	1,950	410	298
9755..	0.074	0.130	0.080	0.50	19.0	......	......	1.6	481	348	256
9756..	0.068	0.204	....	0.30	7.7	......	......	4.4	204	185	130
9757..	0.038	0.110	....	....	5.5	......	......	3.0	155	145	113
9758..	0.236	0.680	0.005	0.01	5.2	......	0.01	20.4	386	309	193

Sample Number.	Odor.	Color.	Turbid'y	Condition.
9755...............	0	0	2	Contaminated.
9756...............	0	0	2	Nitrogenous organic water present.
9757...............	0	0	8	" " "
9758...............	0	25	40	Polluted.

"5. *The River Intake.* On May 16, immediately following the above described fire stream test, special observations were made as to the depth of the river intake pipe with respect to the lake or river level with a view to estimating the carrying capacity of the intake. Special examination was made upon request from the city authorities who also insisted that an actual test of the operating efficiency of the intake be made by the Commission's staff. In the discussions of this matter on the ground, attention was drawn to the fact that a supply of boiler water for the water works plant and also for an important industry have been drawn from the intake since its original installation.

"In company with the mayor, the Commision's engineer interviewed the chairman of the special committee appointed by the city council in 1889 to conduct an official test of the river intake before its formal approval as a part of the water works system. This acceptance test, made previous to the serious contamination of the river water, is described as altogether satisfactory to the committee.

"It was also learned that a practical test of the intake of the kind now requested was made within the past few years by the water company under orders from the city officials. The test referred to showed satisfactory results. In view of the unusually low cycle of lake levels supplementary calculations as to the carrying capacity of the intake have been made for present conditions, the results of which calculations confirm the previous satisfactory tests above referred to. Under the above described circumstances it was deemed unnecessary to repeat the test.

"6. *Conclusions.* In the light of these investigations the following conclusions are submitted for the consideration of the Commission.

"*Source of Supply.* The present well supply of the Manitowoc Water Works Company is drawn in part from the underflow which runs eastward towards Lake Michigan from the glacial drift, substantially as set forth in the accompanying Slichter report, and in part by back-flow directly from the lake itself. The most direct proof of the lake connection is found in the large annual range of temperature of the pumped water, some twenty degrees from winter minimum to summer maximum, as compared with a normal range of only three degrees or so customarily found in Wisconsin ground water supplies free from local disturbing influences. The influence of the varying lake water temperatures (from near freezing in winter to seventy degrees or higher in summer) is further illustrated by the erractic fluctuations in observed temperatures of water in the well points between the mother well and the lake shore line. The fact of a lake connection is still further confirmed by the results of the water examinations.

"*Quality of Water.* The quality of the water as indicated by examination of samples taken from the wells and by actual use in the city is found to be satisfactory. The freedom of the company supply from signs of contamination, such as were found in the samples taken from the surface wells some distance to the westward and also in the samples taken from the lake, indicate that the present supply is adequately filtered. Whether this condition can be depended upon to continue indefinitely with increasing proximity to contaminating causes to the westward, and with the growing lake water contamination by sewage discharged both into the river and also directly into the lake itself, cannot at present be determined. That portion of the supply which is derived from the glacial drift can doubtless be safeguarded by acquiring the lands to the westward for park purposes, and the efficiency of the protection against contamination from the water drawn from the lake will probably be somewhat increased in future by the fact that the former shore erosion at this point appears to have ceased, with the lake now making ground and increasing the depth of filtering material. While the danger of contamination from either direction now appears to be somewhat remote, the matter is of such importance as to demand the greatest vigilance. The treatment of the sewage may be found to be necessary at no distant date and in that event the danger of contaminating the present well supply from the lake side would at once be reduced.

"*Quantity of Water.* The yield of the wells as indicated by the recent tests, taken into consideration with the provisions made by the company in the way of reservoir capacity, warrants the conclusion that the supply is adequate for present demands. Furthermore, it is reasonably certain that the supply is susceptible for further development on the land now owned by the company. In this connection it should be noted that the proximity of the lake and the resulting influence towards increasing the supply of water is, on the whole, not to be regarded as a disadvantage so long as the filtration remains sufficient to prevent contamination of quality.

"*The River Intake.* The intake to the Manitowoc river was constructed as a part of the original plant to provide an emergency supply to meet the demands of fire service in case of failure of the well supply. Until recently there has been much reluctance on the part of the city authorities to have this intake included in the valuation of the property, at first on the ground that it is a menace to the city owing to the pollution of the river water, and more recently because of the claim of inefficiency of the intake itself because of alleged defects or errors in its construction at the river end. In deciding these disputed points due consideration should be given to the fact that in the first instance the river connection was established under orders from the city authorities with a view to safeguard insurance rates; also, since the intake was subject to an acceptance test, the responsibility for defects of original construction must have been shared in some measure by the city officers in control at the time of original construction. It so happens that responsibility for the acts of predecessors with reference to the intake, as to all other features of the original plant, falls alike on the present city officials and the present owners of the plant. There is found to be no doubt as to the operating efficiency of the intake, for within recent years the river supply has been secretly drawn upon during the progress of at least one serious fire, and further, it was found that a successful test of the intake early in 1907 was made upon demand of the city authorities. The foregoing facts, confirmed by calculations based upon the recent extremely low cycle of lake and river levels, justify the conclusion that in the event of the exhaustion of the supply of water from the wells and reservoir, the river intake would satisfactorily perform the service for which it was installed. This conclusion is consistent with the general local belief that the fire hazard in Manitowoc would be materially increased with the elimination of the river intake, unless a lake intake to deep water or other equivalent supply be provided.

"*Value of the Water Supply.* The value of the present developed water supply of the Manitowoc Water Company, considered as an item separate and distinct from the site or the wells and other physical appurtenances involved in the utilization of the supply, may be considered in relation to what the present well supply could probably be sold for to one of the local industrial establishments; or the probable cost of developing or establishing an equivalent substitute supply; or the actual cost to the present owners of establishing the present well supply; or a combination of these features or elements.

"Considering the attempts of various local manufacturing establishments at Manitowoc to develop independent sources of water supply, it is evident that the present water works wells would have a commercial value to such of these industries as could conveniently and economically utilize the water from these particular wells. Since it is the practice, where possible, to develop such independent industrial supplies within the plant premises, it must be assumed either that the industry would be located adjacent to these wells on or near the land now owned by the water works company, or in the case of an industry already established at considerable distance from the wells, that the expense of purchase of the site of the wells and of establishing an isolated pumping plant would necessarily be incurred. It is difficult to follow out this hypothesis and estimate the value of these wells with reference to individual industries at Manitowoc, but it is clear that in any event the owner of an excellent water supply, like the one under consideration, would be fairly entitled to a compensation in keeping with the legitimate cost of discovery and development, with a further allowance for profits and also for the elimination of the element of uncertainty which often attends the establishment of a water supply. This normal or legitimate basis of compensation might, of course, be considerably departed from under certain circumstances, giving rise on the one extreme to the minimum or least price when the owner feels an urgent necessity of selling and the purchaser is reluctant to buy; or under the reverse conditions, to a figure which may at times be fairly regarded as extortionate. Although the extreme figures referred to, resulting from these abnormal conditions of demand and supply, may depart widely from the 'equitable price' basis necessarily assumed in the present discussion, such extreme figures, if known, would possess interest and value as indicating the limits or range within which the adopted valuation figures should properly fall.

"In the assumption of an important local industry, demanding a large supply of water of excellent quality, negotiating to buy the wells under consideration, the extreme limits for the equitable price asked for the developed water supply as an item distinct from the land or other physical features might range all the way from nothing whatever, as the minimum, up to a maximum price fixed with reference to the basis already referred to, viz., the estimated cost of procuring another water supply as nearly as may be equivalent to the one under consideration. If the development of an identical well supply in the same vicinity should appear to be reasonably possible, the probable cost of such development would obviously be the fair assumption to adopt in fixing the maximum compensation, and this under normal conditions would be both the maximum and also the fair price to fix for this item. If it be assumed, however, that no other well supply substantially equivalent to the one discussed can be developed, the nearest equivalent to this established well supply would, in this case, appear to be a supply taken directly from Lake Michigan by an intake to deep water. But this latter basis, under existing conditions, would give a figure far above the limits that could consistently be asked of any industrial establishment now operating in Manitowoc; and, in any event, this method must be regarded as giving merely the absolute or ultimate limit beyond which no one would conceivably think of going in fixing the compensation for the water supply in question. Nevertheless, as already indicated, even this extreme maximum is of interest and value as an aid in judging of the equity of the final figure to be assigned as the value of these wells.

"The time will doubtless come when, like the other large cities along the shore of Lake Michigan, the city of Manitowoc will find it necessary to draw its water supply directly from the lake. When the necessity for such action arrives, the owner of the water works will be obliged to meet the expense of constructing an intake out to deep water to secure reasonable immunity from sewage contamination and ice obstruction. After the intake has actually been constructed a valuation of the plant will of course include that item in the inventory of physical property, but until that time there would appear to be no justification for including the intake on a purely hypothetical basis.

"In the preliminary valuation of the Manitowoc Water Works Company's property submitted by the Commission's staff as of date Dec. 1, 1907, an additional allowance of some $5,000 was tentatively made to cover the separate value of the water supply. This figure was equal in amount to the value placed by the staff upon the company's land at the site of the wells, and the tentative adoption of this method by the staff was in line with a method considered by the appraisal board which submitted a report on the value of this plant under date of Dec. 26, 1906, previous to the enactment of the Public Utilities Law. This method is obviously crude and arbitrary and not of general application, although in this instance it gave a result which seemed to the staff to be fairly reasonable. This favorable opinion, upon further consideration, is found to rest upon the fact that the figure then tentatively taken is not far from the probable cost of exploration and preliminary development for a well supply similar to the present one. On reviewing the actual history of the development of the present well supply, evidence is found of some unusual costs due to preliminary difficulties of construction which may in part be associated somewhat closely with the experimental element connected with the development of such a supply.

"In the light of all the facts and data gathered in this investigation, it would appear that if an additional allowance for the value of the water supply as a separate item were allowed, the figure should lie somewhere between $3,000 and $7,000.

"*Adequacy of Plant.* Considering all the information brought together in the records of the hearings and in the course of the special investigations undertaken by the staff by instructions from the Commission, the conclusion is reached that the Manitowoc Water Works plant is reasonably adequate to perform the service for which it was constructed."

The results of the investigations as described in the above report appear to sustain the opinion of Professor Slichter that some portion of the present water supply is drawn from the lake. Professor Slichter stated in his testimony:

"This same underflow, if it comes from the land, should be intercepted farther back; if it comes from the lake in any large part, I regard it as valueless and worthless, in fact as very undesirable, as the lake at this point is undoubtedly contaminated, at times at least. I do not regard that the particular location in my judgment is a desirable one or an especially advantageous one for an underground supply. I think that it was poor judgment to attempt to build an infiltration gallery along the shore of the lake that must be contaminated, or to build it along the bank of a river in as close proximity. It was not a point that I would first select for a survey for an underground supply for the city. I would try to get above the drainage of the city so far as possible and not get to a point where the city must grow above me and around me."

The failure of the attempts made, so far, in and around Manitowoc to locate a supply similar to that of the company were not conclusive evidence in Professor Slichter's opinion that such supply could not be located. Witness stated that the gravel deposits in which such supplies were found were usually very irregular in shape and that a systematic survey by means of test wells would locate the underground stream in which this water was flowing and would locate the most favorable point for its interception.

Reviewing the facts brought out in the testimony and investigations in these proceedings it appears that:

(1) The tentative valuation of physical property of Jan. 1, 1911, found a cost of reproduction of $249,440 and a present value of $231,647.

(2) The present value of the land owned by the company is

given in the tentative valuation as $6,160. This figure, it is believed, should stand.

(3) Group 2, "Wells, intake and suctions" is given a cost new by the staff of $25,433 and a present value of $22,936. This group includes the suction well, mother well, new well, filter galleries, suctions and river intake. The values given by the staff for the wells and galleries are believed to be fair and reasonable, and cannot be increased because of the company's claims as regards a high original cost. The filter galleries constituted a part of the experimental work conducted to secure a supply; that they are now used and useful as storage reservoirs and should be included in the valuation. The river intake is found to be adequate, to have been required by the city, and cannot in fairness and justice be excluded from the valuation.

(4) The reservoir and standpipe are given a total cost new of $19,138 and a present value of $16,025. The reservoir is a new structure worth $6,456, and has not depreciated. The standpipe is found to be worth $9,569 and is in fairly good condition.

(5) The tentative valuation gives the distribution system a cost new of $142,449 and a present value of $139,377. River crossings are given a present value of $10,350, the staff's valuation being accepted for this item. The prices used by the staff on cast iron mains are based on a five year average of current prices. It is believed to be extremely doubtful that the city would have insisted that current prices be used if current prices at the date of valuation were above the five year average. It is not believed to be either just or reasonable to permit current prices due to temporary and abnormal conditions to govern in the determination of value either for the purpose of sale or rate making. Unit prices are found to be somewhat lower on a two or three year average basis than on the five year basis. In view of the facts as regards the condition of the mains, the unit prices used by the staff, together with other facts, it appears that the present value of the distribution system in this case, as given by the staff, is perhaps liberal and may be reduced by from $5,000 to $10,000.

(6) Power plant equipment is given a cost new by the staff of $8,895, with a present value of $5,087. In the light of the thorough investigations made as regards the adequacy and present condition of the equipment included in this group, the values assigned by the staff are believed to be fair and reasonable to both the company and the city.

(7) The values given in the tentative valuation for buildings and miscellaneous structures, office furniture and appliances, tools and horses, wagons and miscellaneous equipment are accepted .

(8) No sufficient grounds for reducing the 12 per cent allowance for engineering, interest during construction, contingencies, omissions, etc., have been discovered and the allowance made by the staff should stand.

(9) Stores and supplies are given a present value of $2,840 by the staff. These items, together with fuel and oil on hand, are not included in the final value fixed herein and their value is to be determined at the date of the transfer of the property.

(10) No allowance is made for the cost of paving not actually cut through and replaced by the company.

(11) Non-operating property is found to include equipment which is used and useful in the operation of the plant and this equipment is, therefore, included in the valuation.

(12) The company claims that the earning value of the plant at the close of 1910 is about $436,855. The city finds an earning value of less than the present value of the physical property, or about $203,952.

Careful study of the original cost of the plant, both to the former and the present owners, the subsequent additions and extensions thereto, its earnings and expenses and other factors as illustrated in tables XI and XII, indicates that the true earning value of the plant during the past few years will be found to average about $235,000. This figure is somewhat lower than the cost of reproducing new the physical property of the plant, and somewhat higher than the cost of reproduction new of this property or plant less its depreciation. It also points to the fact that if a lower price than this is fixed for the plant the owners would obtain less than ordinary compensation for their property.

(13) After a careful consideration of the information brought out by the testimony and special investigations, the conclusion is reached that the plant is reasonably adequate to perform the service for which it was constructed.

(14) It appears clearly established that a part of the water supply comes from the lake, that the supply is pure and satisfactory for domestic and industrial uses, that it is adequate to meet present demands, that it is susceptible of further develop-

ment, that great danger of contamination exists and that constant watchfulness and care must be exercised to safeguard the supply in the future, and that the value of this supply does not exceed the average cost of discovering the same as estimated above by the engineers of this Commission.

In the light of the facts brought out in these proceedings in regard to the capitalization of the plant, its original cost, its subsequent extensions and additions to property, its cost of reproduction, its present value and its earning value especially since its acquirement by the present management, and the adequacy and character of its water supply, together with other facts, lead to the conclusion that a fair and reasonable compensation to be paid by the city of Manitowoc to the owners of the Manitowoc Water Works Company for the property of its water works as described and enumerated herein, is the sum of $236,000. This amount does not include stores and supplies or fuel and oil on hand, or the new additions which may have been made since Jan. 1, 1911.

It is Therefore Ordered, That the just compensation to be paid to the Manitowoc Water Works Company for the taking of the property of said company by the city of Manitowoc, which property consists of the items described above, excepting as stated, the stock and material on hand and the additions to the plant that have been made since Jan. 1, 1911, be and the same are hereby fixed at two hundred thirty-six thousand dollars.

It is Further Ordered, That in addition to the above price the material on hand at the date of taking of said plant and the new additions to the plant that have been made since Jan. 1, 1911, be paid for by the city of Manitowoc at such price as may be agreed upon by the parties themselves, or, in case the parties fail to agree upon a price, at the price fixed by this Commission.

It is Further Ordered, That the city of Manitowoc, unless otherwise agreed between the parties, pay to the Manitowoc Water Works Company the said sum within sixty days from the date hereof.

ARRIES & PACKHAM ET AL.
VS.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted May 9, 1911. Decided June 28, 1911.

Petition complaining that the tariff formerly in effect on respondent's lines allowing one stop in transit to finish loading of live stock, has been changed so that it is now necessary to ship from originating point to stopping point, and from stopping point to destination at the sum of the two locals. This change amounts to a material increase in rates. It was contended by the respondent that the principal reason for the change was to avoid delay in stock shipments. It was shown that the change did not materially affect the time of shipments, and that its principal effect was to increase rates.

Held: That the withdrawal of the stoppage in transit privilege resulted in an unwarranted increase in rates throughout the state on stock shipments stopped to finish loading; that respondent received sufficient compensation in its regular rates on live stock, and in the additional charge for stoppage privilege to warrant an order requiring reinstatement of such privilege in the form in which it was formerly in effect. The scope of this proceeding not covering all of the respondent's lines, such restoration is ordered only for the stations named in the complaint. It is recommended that such privilege be reinstated generally on the lines of the respondent throughout the state.

The petitioners, stock buyers and shippers at several points on the line of the respondent company, allege in their complaint that prior to March 1, 1911, the respondent company had in effect a tariff allowing one stop in transit to finish loading stock at a charge of $2 per car; and that by supplement No. 5 to C. & N. W. G. F. D. No. 5736—F, effective March 1, 1911, this tariff was changed so that it is now necessary to ship from originating point to stopping point and from stopping point to destination at the sum of the two locals, making practically two shipments.

The respondent company, in its answer, admits the change in tariff complained of, and alleges that the privilege of stopping stock in transit to finish loading was taken advantage of only to a small degree as compared with the total traffic, and that this practice was the source of a great many complaints and claims for damage on account of delays incident to the stop, and also resulted, in some instances, in the manipulation of the stock. The respondent further alleges that the rule referred to was canceled generally throughout the respondent's system, and that its cancelation was generally acceptable to all shippers of stock. Wherefore, the respondent prays that the proceeding be dismissed.

The hearing was held at the office of the Commission, May 9, 1911. The petitioners were represented by *W. Packham* and *R. C. Richards*, the respondent by *F. D. Fulton* and *H. C. Cheyney.*

The location and methods of shipment of the various stock shippers who testified at the hearing are shown by the following table:

Shipper No.	Points of origin.	Stopping points.	Principal points of destination.
1	Okee.	Lodi, Dane.	Milwaukee.
2	North Freedom.	Baraboo.	Milwaukee, Chicago.
3	Ablemans.	Baraboo.	Milwaukee.
4	Blue Mounds.	Verona.	Chicago.
5	Barneveld.	Blue Mounds, Verona.	Chicago.
6	Madison, Syene Oregon, Brooklyn, Evansville, Magnolia.	Madison, Syene, Oregon, Brooklyn, Evansville, Magnolia.	Chicago, Milwaukee.

These shippers all testified that the change complained of had the result of increasing their freight charges very considerably, the difference varying per 100 lbs. shipped from the point of origin to the stopping point, from 3 to 20 cts., according as the original load is heavy or light.

In answer to the objection of the respondent company, as stated in its answer, that the practice of stopping stock shipments to finish loading caused a delay in arriving at final destination, it was testified that the arrivals at destination had been no more prompt, as to shipments made by the witnesses, since the change in the rule than before the change. It appears that the particular shippers who testified at the hearing, located as shown in the table above, are able to ship from the original point to the stopping point on a way freight, and have their fully loaded cars picked up by the fast stock train at the point of stoppage a few hours later. Since this method of shipment caused no delay whatever to the regular stock train, it was claimed by the witnesses for the petitioners that the reason given by the respondent company for the change in the rule did not apply to them.

The representatives of the respondent company, on the other hand, while admitting that the situation of the particular shippers involved in this complaint was such, as to train service, that the delay ordinarily incident to stopping to finish loading did not occur in their cases, insisted that no reinstatement of the rule could be made which would relieve these particular shippers without making the reinstatement general throughout the state, and thus making it apply to places not so conveniently situated as to way freight service. It was testified that the respondent company had received many complaints from shippers in various parts of the state on account of the delay caused by holding the regular stock trains while certain shippers finished loading. Such stoppages had resulted, it was testified, in delaying trains from fifteen minutes to an hour or more at a time, and the claims for damage due to loss of market by late arrivals had been very considerable.

It was further testified by witnesses for the respondent company that the system of stopping to finish loading had given rise to abuse, in the fact that shippers would unload their stock at the stopping point and ship out entirely different stock in the same car, or would take the opportunity to regrade and rearrange the stock in the cars at the stopping point, thus causing much delay. As a result, it was possible for shippers to ship stock to the shipping point and to ship other stock out from such point on a through rate instead of making two shipments at local rates. It was claimed to be impossible for the agents at the smaller stations so to supervise the loading of the cars that these irregularities would not occur; and it was urged that these practices of shippers were an additional justification for withdrawing the the stoppage in transit privilege as it existed previous to March 1, 1911.

It was claimed by the representatives of the respondent company that the change in the rule complained of was apparently acceptable to the majority of shippers upon its line, since no complaints had been made except the one involved here; that since the total stock shipments on the respondent's line for six months, October, 1910, to March, 1911, inclusive, were 4,594 cars to Chicago and 2,960 to Wisconsin points, the number of the shipments that required stopping to finish loading was too inconsiderable to be of weight against the convenience of the great majority; that the proper attitude for the shippers making this complaint to take would be to endeavor to readjust their business to meet the new conditions caused by the change in the rule: for example, to drive their stock across country the five or ten miles that they would have shipped it by railroad before the change in the rule, and thus be able to make full carload shipments from one point.

The stoppage in transit rule, cancelation of which is the occasion of the complaint in this proceeding, reads as follows:

> "Cars loaded with live stock may be stopped once in transit to finish loading, when the stopping point is on the direct line between point of shipment and destination, at a charge of $5 per car in the case of horses and mules, and $2 per car for cattle, hogs and sheep. Such stop is to be limited to 48 hours, and no portion of the contents of the car as loaded at the original point of shipment is to be left at the stopping point."

The following table illustrates the manner in which the rates to Milwaukee and Chicago from the various points embraced in the testimony have been raised by the cancelation of the rule. The compilations given assume in each case a car loaded with cattle only to the minimum capacity of 22,000 lbs., as established for cars between 33 ft. 9 in. and 36 ft. 7 in. in length. If the load from the stopping point to final destination were greater than the minimum, the discrepancy between the charges would be still greater. The table covers only cattle rates. The increase in the charges on hogs to and from the same points would average somewhat less.

TABLE I.

INCREASE IN RATES ON CATTLE TO MILWAUKEE AND CHICAGO.

Assuming Cars Loaded to Minimum Weight.

PRESENT RATES.			FORMER RATES.			
Points.	Rate.	Charge.	Points.	Rate.	Charge.	Increase per car.
Okee to Lodi	3	$6 60	Stoppage charge		$2 00	
Lodi to Milwaukee	10.7	23 54	Okee to Milwaukee	11.8	23.76	
Total to Milwaukee		$30 14	Total to Milwaukee		$25 76	$4 38
Lodi to Chicago	12.5	27.50	Okee to Chicago	12.5	27 50	
Total to Chicago		$34 10	Total to Chicago		$29 50	4 60
Okee to Dane	4	8 80	Stoppage charge		2 00	
Dane to Milwaukee	10.4	22 88	Okee to Milwaukee	10.8	23 76	
Total to Milwaukee		$31 68	Total to Milwaukee		$25 76	5 92
Dane to Chicago	12.5	27 50	Okee to Chicago	12.5	27 50	
Total to Chicago		$36 30	Total to Chicago		$29 50	6 80
No. Freedom to Baraboo	4	8 80	Stoppage charge		2 00	
Baraboo to Milwaukee	11.1	24 42	No. Freedom to Milw	11.3	24 86	
Total to Milwaukee		$33 22	Total to Milwaukee		$26 86	6 32
Baraboo to Chicago	14	30.80	No. Freedom to Chicago	14.5	31 90	
Total to Chicago		$39 60	Total to Chicago		$33 90	5 70
Ablemans to Baraboo	4	8 80	Stoppage charge		2 00	
Baraboo to Milwaukee	11.1	24 42	Ablemans to Milwaukee	11.4	25 08	
Total to Milwaukee		$33 22	Total to Milwaukee		$27 08	6 14
Baraboo to Chicago	14	30 80	Ablemans to Chicago	14.5	31 90	
Total to Chicago		$39 60	Total to Chicago		$33 90	5 70
Blue Mounds to Verona	5.3	11 66	Stoppage charge		2 00	
Verona to Milwaukee	10.3	22.66	Blue Mounds to Milw	11	24 40	
Total to Milwaukee		$34 32	Total to Milwaukee		$26 2	8 12
Verona to Chicago	12.5	27 50	Blue Mounds to Chicago	12.5	27 50	
Total to Chicago		$39 16	Total to Chicago		$29 50	9 66
Barneveld to Blue Mds	3	6 60	Stoppage charge		2 00	
Blue Mds. to Milwaukee	11	24 20	Barneveld to Milwaukee	11	24 20	
Total to Milwaukee		$30 80	Total to Milwaukee		26 20	4 60
Blue Mds. to Chicago	12.5	27 50	Barneveld to Chicago	13	28 60	
Total to Chicago		$34 10	Total to Chicago		$30 60	3 50
Evansville to Magnolia	3	6 60	Stoppage charge		2 00	
Magnolia to Milwaukee	10	22 00	Evansville to Milwaukee	10	22 00	
Total to Milwaukee		$28 60	Total to Milwaukee		$24 00	4 60
Magnolia to Chicago	10.5	23 10	Evansville to Chicago	10.5	23 10	
Total to Chicago		$29 70	Total to Chicago		25 10	4 60
Evansville to Brooklyn	4	8 80	Stoppage charge		2 00	
Brooklyn to Milwaukee	10.4	22 88	Evansville to Milw	10	22 00	
Total to Milwaukee		$31 68	Total to Milwaukee		$24 00	7 68
Brooklyn to Evansville	4	8 80				
Evansville to Chicago	10.5	23 10	Brooklyn to Chicago	11	24 20	
Total to Chicago		$31 90	Total to Chicago		$26 20	5 70

TABLE I.—Concluded.

INCREASE IN RATES ON CATTLE TO MILWAUKEE AND CHICAGO.

Assuming Cars Loaded to Minimum Weight.

PRESENT RATES.			FORMER RATES.			
Points.	Rate.	Charge.	Points.	Rate.	Charge.	Increase per car.
Brooklyn to Oregon........	4	$8 80	Stoppage charge...........		$2 00	
Oregon to Milwaukee	10.4	22 88	Brooklyn to Milwaukee...	10.4	22 88	
Total to Milwaukee.....		$31 68	Total to Milwaukee.....		$24 88	$6 80
Oregon to Brooklyn........	4	8 80				
Brooklyn to Chicago.... ...	11	22 88	Oregon to Chicago.........	11.5	25 30	
Total to Chicago........		$33 00	Total to Chicago........		$27 30	5 70
Oregon to Syene............	3	6 60	Stoppage charge...........		2 00	
Syene to Milwaukee........	10	22 00	Oregon to Milwaukee......	10.4	22 88	
Total to Milwaukee.....		$28 60	Total to Milwaukee.....		24 88	3 72
Syene to Oregon...	3	6 60				
Oregon to Chicago....... ..	11.5	25 30	Syene to Chicago..........	12	26 40	
Total to Chicago........		$31 90	Total to Chicago........		$28 40	3 50
Syene to Madison...........	3	6 60	Stoppage charge...........		2 00	
Madison to Milwaukee.....	10	22 00	Syene to Milwaukee.......	10	22 00	
Total to Milwaukee.....		$28 60	Total to Milwaukee....		$24 00	4 60
Madison to Syene...........	3	6 60				
Syene to Chicago............	12	26 40	Madison to Chicago........	12	26 40	
Total to Chicago........		$33 00	Total to Chicago........		28 40	4 60

Table I shows that in the case of the specific points selected as samples, with the load assumed to be only the minimum, the change in the rule has resulted in an increase varying from about $3.50 to $9.50 per car. The variation between the former and the present rates increases rapidly with the distance from the point of origin to the point of stoppage.

The rates on live stock from all points in the state on the respondent's line to Milwaukee were fixed by the Commission *In re Rates on Live Stock*, 1 W. R. C. R. 778. These rates have remained in effect continuously since the order in that case, and the rule permitting stoppage to finish loading at a charge of $2, in effect at the time such rates were made, continued in force until March 1, 1911. When the rates to Milwaukee were fixed, the Commision had before it and gave consideration to the rule which has now been withdrawn, and the rates fixed were made with reference to the entire service performed by the railways, of which the stoppage privilege was a part. A quotation from the *Live Stock* decision will show the liberal manner in which the rates therein fixed were arrived at. The Commission says, page 810:

> "The costs in each case, or for the loading represented by each class of the stock, were also increased by the cost of extra empty car mileage, by one dollar and a half per each carload for the cleaning of the cars and for other incidental items, by interest upon the investment at the rate of 10 per cent on what is regarded as a fair valuation of the road, and by an additional item over and above those which have been mentioned, for other contingences."

The delay of the stock trains in reaching Milwaukee and Chicago, claimed to be largely increased by the use of the stoppage privilege, was the principal reason given by the representatives of the respondent company for the discontinuance of that privilege. As a matter of fact, however, it is plain from the testimony that the effect of the change which has been made in the stoppage rule is not primarily to alter the condition of the train service, but merely to raise the rate for the identical service. Thus, the shippers at North Freedom and Okee can still ship partially filled cars to Baraboo and Lodi, respectively, by the way freight and have the regular stock train pick up their fully loaded cars at the stoppage point; but it must be done at a higher rate than formerly. Any delay which is to be traced to the system of stoppage in transit as formerly in vogue must still continue to exist, so far as any direct result of the change in the rule is concerned. If the changing of the rule has operated, as the testimony of division superintendent of the respondent company indicated that it had, to make the arrivals of stock trains in Milwaukee and Chicago more prompt, it is because the increase in the rate has deterred shippers from making a stop to finish loading, and not because the quality of the train service in itself has been improved by the change. In other words, the stock train service has been improved, if at all, by fixing rates so high as to discourage patrons from attempting to use a branch of the service which may tend at some points to delay trains.

It would seem, then, that the improvement of the service which the respondent's officials claim to have been the object of the change in the rule, is only an indirect effect of the change, and that the direct effect is to raise the rates to stock shippers for the same service they were previously receiving. As has been stated before, the rates on live stock to Milwaukee were fixed with a view to all the conditions existing at the time, which included the stopping to finish loading at an extra charge of $2. If the rates so fixed were sufficient to cover all the costs of transportation, including, of course, the proportion of the loss and damage account chargeable to stock shipments, it is difficult to see why an increase of those rates should be permitted under the guise of an attempt to improve the service.

Furthermore, in the case of the particular points involved in this proceeding, the testimony shows that no delay of fast stock trains can be attributed to the practice of stopping in transit. These localities are so situated that it is possible to ship the partially loaded cars by way freight trains to the stoppage point and have them picked up, fully loaded, by the regular stock train later in the day. Therefore, as to these shipping points, it is especially clear that the objection of the respondent company relating to the delay to through stock trains is invalid.

In addition to the claim that the use of the transit privilege delays its stock trains, the respondent company laid emphasis upon the fact that the privilege is abused by shippers who make a practice of re-sorting and re-grading stock at the stoppage point, and of even unloading the stock shipped to the stoppage point and forwarding from that point an entirely new consignment. This evil of manipulation, so-called, was not claimed to be chargeable against the particular shippers in this case, but was presented as an argument against the entire practice of stopping stock shipments on a through rate to finish loading. It is undoubtedly true that there is frequent opportunity for manipulation in the manner described, but the fact that some dishonest shippers may use a transit privilege to defraud the railway company is hardly a sufficient reason for withdrawing the privilege. If the practice were so general and so difficult of prevention as to be necessarily a part of the service rendered, the discontinuance of the privilege or an increase in its price might be justified; but it has not been claimed that any large percentage of the shippers abuse the privilege, and it is not shown that the abuse is such as cannot be detected and prevented by the use of a reasonable degree of diligence. These facts make it impossible to ascribe controlling importance to the possibility or even the actual practice of manipulation of stock shipments at stopping points.

It is the opinion of the Commission, upon all the facts presented at the hearing and all the information otherwise obtained, that the respondent company received a sufficient compensation in its regular rates on live stock and in the $2 charge exacted for the exercise of the stoppage privilege, to warrant an order requiring the reinstatement of the stoppage privilege in the form in which it was formerly granted. While the scope of this proceeding does not demand that an order be made restoring the stoppage privilege throughout the respondent company's line in Wisconsin, the rule is manifestly of such character as can be applied to best advantage throughout the state and not merely at particular stations. The investigations of the Commission have led to the conclusion that the withdrawal of the stoppage privilege resulted in an unwarranted increase in rates throughout the state on stock shipments stopped to finish loading, and it will be recommended that the rule as formerly in effect be reinstated on the entire line of the respondent company in Wisconsin. It is deemed advisable, however, to confine the order in this case to the stations immediately involved in this proceeding.

IT IS THEREFORE ORDERED, That as to stops at the stations named below, the respondent, the Chicago & North Western Railway Company, reinstate the rule hereinbefore quoted, relating to stoppage in transit to finish loading of live stock. The stations to which this order shall apply are Baraboo, Lodi, Dane, Blue Mounds, Verona, Madison, Syene, Oregon, Brooklyn, Evansville and Magnolia.

It is recommended that the respondent, the Chicago & North Western Railway Company, reinstate the said rule as to all points upon its line in the state of Wisconsin.

EDEN INDEPENDENT LIME AND STONE COMPANY
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted May 31, 1911. Decided June 30, 1911.

Petition for a spur track at Marblehead, Fond du Lac county. The previous orders of the Commission, made in relation to this spur track, 4 W. R. C. R. 233, 788, and 5 W. R. C. R. 110, were reversed by the supreme court, 144 Wis. 523. The facts presented are the same as in the previous case. The respondent is ordered to construct a spur track as designated in the order within sixty days.

The petitioner is a corporation engaged in operating stone quarries and lime works at Marblehead, in the town of Eden, Fond du Lac county, Wis. It alleges that since its organization it has been engaged in the construction of its plant, building lime kilns, and making other preparations necessary to the prosecution of its business; that it is capitalized at $25,000 and is the owner in fee of about twenty-three acres of lime stone ledge situated in section 6, township 14, range 18 east, and including all of the south half of the southeast quarter of the southwest quarter of said section in Fond du Lac county; that said ledge is worth at least $20,000; that in addition thereto said company has $5,000 in cash and ample building materials, including lumber, for the construction of its plant and its successful operation, for many years to come; that said ledge is situated about three-eighths of a mile distant from a public highway and lies about one-half mile from the main track of the Chicago & North Western Railway Company, on the air line between Fond du Lac and Milwaukee; that the same lies about 400 feet distant from the western terminus of the second northerly spur track now existing and used by the Union Lime Company of Milwaukee, Wis., as shown on the map annexed to the petition; that it has no track service whatever and no outlet for its product; that it will be necessary and indispensable to a successful operation of said industry and the conduct of said business to have the use of a spur track leading to and from the real estate aforesaid of the petitioner; that the cheapest, most feasible and most practicable plan would be to extend the aforesaid existing spur track, now serving the Marblehead lime company and connected at that point with the main track of the respondent railway company; that if said plan be followed it will be necessary to condemn only about 400 feet of the Union Lime Company's land for a right of way, and to construct in all not to exceed 1,300 feet of extension track to serve petitioner; that such extension track can be constructed and operated without any damage or harm to the public interest and without any serious or unreasonable interference with the conduct of the business of the other lime companies using said track; that without some spur track to serve petitioner it will be absolutely impossible to put the plant into operation; that the Nast Brothers Lime & Stone Company of Marblehead, Wis., and the Union Lime Company, aforesaid, of Milwaukee, Wis., are competitive corporations, engaged in the same line of business as petitioner, and using the existing spur track above mentioned; that petitioner is informed and verily believes that said lime companies are interested in said existing spur track and have contributed to the cost of constructing the same, and that they are hostile and opposed to the proposed extension of said spur track for the purpose of serving petitioner; that the construction of a new and independent spur track from the main line of said railroad to the plant of petitioner would be far more expensive and of more damage to the public traffic on the main line of said railroad, and wholly unnecessary; that petitioner applied to the respondent railroad for the construction of said extension track and received in reply the following: "Our rights in connection with the trackage serving the Marblehead Lime Company are such that they will not permit us to make any extension to their track for the purpose of serving others without their consent, and unless you can obtain this from the Marblehead Lime Company it will be impossible for us to favorably consider the matter;" that said "Marblehead Lime Company" refers to the Union Lime Company aforesaid; that said Union Lime Company has declined the request of petitioner to consent to such an extension, and petitioner is informed and verily believes has threatened to obstruct and interfere with the use of such side track by petitioner in case the same shall be built as proposed; that heretofore, to-wit, in the month of August 1909, petitioner herein filed a petition with the Railroad Commission of Wisconsin praying for the extension of the track marked "C" on the above mentioned map, from the terminus thereof to the site of petitioner's lime kiln; that notice of the filing of such petition, fixing a date for the hearing thereof, was served upon the respondent, but no notice was given to the Union Lime Company or to the Nast Brothers Lime & Stone Company; that a hearing of said petition was had before the Commission on Sep. 16, 1909, at which hearing said railway company made no opposition to the extension of track prayed for, and thereupon an order was entered by the Commission directing the building of the track as prayed along the line indicated on said map; that thereafter, and on Oct. 28, 1909, the said Union Lime Company and the Nast Brothers Lime & Stone Company filed with the Commission a petition asking that the aforesaid order be vacated and that they be given leave to intervene in the proceeding; that such application was granted and a second hearing had before the Commission on Dec. 17, 1909; that on March 24, 1910, the Commission made an order directing the construction of a track from some point on the main spur between the points marked "X" and "Y" on said map, thence between the track marked "C" and the Union Lime Company's office building, to and upon the land of petitioner, as shown on said map, but failing to provide for the payment of the cost of such track by petitioner; that thereafter, and on April 1, 1910, the Commission, without notice to any of the parties aforesaid, made a third order requiring said railway company to extend the track marked "D" to and along the kiln shed belonging to petitioner as shown on said map; that thereafter, and on April 21, 1910, the said Union Lime Company and Nast Brothers Lime & Stone Company commenced an action in the circuit court for Dane county, Wis., against the Railroad Commission to set aside the aforesaid third and last order of the Commission and to enjoin the execution thereof; that on May 23, 1910, petitioner asked leave to intervene in such action and become a party defendant, which leave was granted over the objection of said Union Lime Company and Nast Brothers Lime & Stone Company; that the defendants were granted judgment in said action dismissing the complaint, from which judgment said Union Lime Company and Nast Brothers Lime & Stone Company appealed to the supreme court of the state of Wisconsin; that said supreme court held, among other things, that an order of the Railroad Commission directing the construction of a spur track made without giving to any party interested therein or affected thereby an opportunity to be heard, must be set aside on that ground, though a hearing had previously been given as to the different route in which all the parties interested participated, and reversed the judgment of said circuit court of Dane county and remanded said cause for further proceedings according to law; that petitioner is desirous of the immediate construction of said track and offered and agreed to pay such reasonable and proper costs of the construction of same and of the right of way and to construct same itself, also to pay its equitable proportion of the cost of the existing spur track as may be required by the Commission, and otherwise to comply with the necessary and reasonable requirements of the Commission under the laws of the state of Wisconsin, especially ch. 491 of the Laws of 1909, aforesaid.

Wherefore, petitioner prays that a day be set for the hearing of the matters and things herein contained, and that the proper officers of said railway company and of said lime companies be subpoenaed or cited to appear at said hearing in order that a full hearing of the rights of all concerned may be taken pursuant to law, to effect the speedy construction and completion of the proposed spur track aforesaid.

The respondent railway company, answering the petition herein, alleges that it is willing to carry out and perform such order in the premises as the Commission shall deem best and as it is authorized to make.

The Union Lime Company and Nast Brothers Lime & Stone Company, to whom notice of hearing was given, appeared and filed an answer wherein they admit the incorporation of the several corporations mentioned in the petition herein stated, and that petitioner is the owner of the tract of land mentioned in the petition, and has commenced the construction of a lime-burning plant thereon, but as to the amount of capital of said petitioner and the amount on hand, or its resources for building and conducting said lime-burning plant, they have no knowledge or information sufficient to form a belief; and these respondents further allege that the Union Lime Company is now the owner and it and its predecessors in title have been for more than twenty years last past the owners and in possession of the southwest quarter of the southeast quarter or section 6, town 14, range 18 east, in Fond du Lac county, Wis., except the east two acres thereof, lying immediately east of and adjoining the lands of the petitioner described in the petition, and have erected thereon extensive and costly plants for the manufacture of lime and crushed stone and the quarrying of building stone, and during all of said time said Union Lime Company and its predecessors in title have conducted thereon, and said Union Lime Company now conducts thereon the business aforesaid; that the Nast Brothers Lime & Stone Company is now the owner and it and its predecessors in title have been for more than twenty years last past the owners of the southeast quarter of the southeast quarter of said section, and also the east two acres of the southwest quarter of the southwest quarter of said section, and have erected thereon large and costly plants for the manufacture of lime and crushed stone and the quarrying of building stone, and have conducted and now conduct thereon the business aforesaid; that the railroad track which the petitioner asks to have extended was constructed about twenty years ago for the exclusive use, benefit and convenience of the Union Lime Company and the Nast Brothers Lime & Stone Company and their predecessors in title, and has been at all times used for the exclusive use, benefit and convenience of said companies, and that the exclusive use of said side track by and for the benefit of said Union Lime Company and Nast Brothers Lime & Stone Company is necessary for the convenient and economical carrying on of their business aforesaid; that the extension of said track as prayed for in the petition and the use thereof for switching cars to the proposed plant of the petitioner will seriously and unnecessarily interfere with the conduct of the business of the Union Lime Company and the Nast Brothers Lime & Stone Company, and will cause each of said companies great, continuous and irreparable injury, the amount and extent of which it is impossible to accurately estimate or determine in advance; that respondents deny that the extension of said track as prayed in said petition is indispensable to the successful operation of petitioner's proposed industry, and on the contrary allege that a spur track can be constructed from the main line of the Chicago & North Western Railway to the petitioner's proposed industry upon a practicable and feasible route other than that asked for in said petition, and without excessive cost, and which will not interfere with the operation of the plants of said Union Lime Company and Nast Brothers Lime & Stone Company or impair the value thereof; that the proposed plant and industry of the petitioner is purely a private enterprise for the exclusive benefit and profit of the petitioner; that the proposed new side track prayed for will begin upon the lands of the Union Lime Company and terminate upon the adjoining lands of the petitioner, will not be accessible to the public at any point, and will be and is intended to be for the sole and exclusive use and benefit of the petitioner in the conduct of its private business, and not for any public use whatever. Respondents further allege, specially set forth and claim that the extension of said side track over and across the lands of the Union Lime Company will take the property of said Union Lime Company for a private and not for a public use and will deprive said Union Lime Company of its property without due process of law, contrary to the provisions of the fourteenth amendment to the Constitution of the United States. Respondents further allege, specially set forth and claim that ch. 481 of the Laws of Wisconsin for the year 1909, otherwise known and designated as section 1797—11m Wisconsin Statutes, under and by virtue of which the petitioner prays for an order requiring the respondent Chicago & North Western Railway Company to construct the proposed spur track aforesaid, is unconstitutional, null and void, for the reason that said statute authorizes the taking of private property for private use, and thereby deprive the owner thereof of his property without due process of law, contrary to the provisions of the fourteenth amendment to the Constitution of the United States.

Wherefore, interveners pray that said petition be denied and dismissed.

Hearing in the above entitled proceeding was held on May 31, 1911. The petitioner was represented by *Paul Husting,* of *Lamoreaux & Husting,* its attorneys. The Union Lime Company and Nast Brothers Lime & Stone Company were represented by *George Lines,* their attorney. The respondent railway company was not represented.

The proceeding herein was instituted because of the vacation of the order of the Commission as made October 11, 1909 (4

W. R. C. R. 233) and modified March 24, 1910 (4 W. R. C. R. 788) and April 1, 1910 (5 W. R. C. R. 110), respectively. The supreme court reversed the order of the Commission upon three grounds: (1) that the Commission had no jurisdiction in a proceeding to compel the construction of a spur track, to pass upon disputed title to land; (2) that changing the order of the Commission so as to compel the extension of a different track from that required to be extended in the original order without notice to the parties interested and without an opportunity for such parties to be heard in the matter, was erroneous; and (3) that thirty days would not give the railway company a reasonable time within which to construct the track. *Union Lime Company v. Railroad Commission,* 144 Wis. 523.

After the filing of the mandate of the supreme court with the circuit court of Dane county, a notice of re-hearing was given, but as at the time no judgment had been entered on such mandate in the circuit court, the re-hearing was continued. Counsel for the petitioner thereupon filed a new petition in order to bring the matter properly before the Commission and to obviate any possible objection that might be interposed to the Commission's proceeding to re-hear the matter upon the original petition in the absence of any express statutory enactment providing for such re-hearing.

The testimony offered in the present proceeding is in every material respect indentical with that given on the former hearing. In fact, the entire record made on the former hearing was substantially read into the record *in toto* in the instant case. It therefore becomes unnecessary again to review the same, as the conclusion reached in the former hearing has in no wise been modified or changed by anything disclosed in the present investigation of the matter.

In *Union Lime Company v. Railroad Commission, supra,* the court says:

> "Had the order been made upon notice and with opportunity of the parties to be heard, it is doubtful if, under the rule laid down in *Minneapolis, St. Paul & S. S. M. R. Co. v. Railroad Commission,* 136 Wis. 146, 116 N. W. 905, this court would interfere with the exercise of the Railroad Commission's discretion in determining that track D should be extended, though it seems from an inspection of the map that the selection of such track would be needlessly injurious to plaintiffs. In this, however, we may be in error."

The Commission is satisfied that the inconvenience to the Union Lime Company would not be any greater and, in all probability, might be less by extending track "D" than by extending track "C." Furthermore, track "D" is the railway company's public track, constructed and operated under and by virtue of the easements in question. Track "C" and the other tracks delineated on the map are private tracks laid upon the premises of the Union Lime Company for the convenient operation of its lime kilns and quarries. We did not regard the latter tracks as forming a part of the railway company's system. If we are in error in this and the Commission has authority to thus extend private tracks, constructed upon the premises of industries for the purpose of conveniently handling the in and out traffic of such industries, it is important that the matter be not left in doubt. From the language of the court it would seem that such authority exists, but as we are unable to find that the attention of the court was directed to the question here suggested, we hesitate to accept the conclusions reached as final, and trust, if the matter should again reach the supreme court for decision, that the question may be positively determined.

It is our judgment that the spur track in question is practically indispensable to the successful operation of the petitioner's lime kiln and quarry, that its construction and operation is not unusually unsafe or dangerous, and that it is not unreasonably harmful to public interest.

If it becomes necessary to acquire a right of way for the proposed extension, the cost of acquiring such right of way, as estimated by us, will not exceed the sum of $200.

IT IS THEREFORE ORDERED, That the Chicago & North Western Railway Company construct a suitable side track as prayed for by the petitioner herein, along the route designated by the blue print attached to the original petition, which side track shall be an extension of the railway company's track marked "D" on said blue print.

IT IS FURTHER ORDERED, That the petitioner herein deposit with the Chicago & North Western Railway Company the sum of $1,660, the estimated cost of the proposed extension, and in addition thereto the sum of $200 to cover the portion of the right of way which has to be acquired by condemnation or otherwise; and also give the railroad company a bond, to be approved by the Commission as to form, amount, and surety, securing the railroad against loss on account of any expense incurred beyond the amount of the deposit with the railroad.

Sixty days is deemed a reasonable period of time within which to comply with the provisions of this order. If for any valid reason compliance with the order can not be made within such time, the Commission will extend the same upon application.

STANDARD LIME AND STONE COMPANY
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Decided June 30, 1911.

Petition alleging overcharges on certain shipments of lime from Oakfield to various points in Wisconsin. Following such shipments a change in classification was made, which had the effect of reducing a part of the rates in question.

Held: That as to a part of the shipments the rates exacted were unusual and exorbitant, and a refund is ordered thereon.

The petitioner is a corporation engaged in the business of manufacturing lime and has its principal place of business at Fond du Lac, Wis. It alleges that on April 10, 1909, it shipped from Oakfield, Wis., to Hackley, Wis., over the lines of the respondent, twenty-five sacks of ground lime, weighing 5,000 lbs.; that respondent charged thereon a rate of 50 cts. per cwt., which amounted on said shipment to a total charge of $25; that on April 17, 1909, petitioner shipped from Oakfield, Wis., to Mountain, Wis., over the respondent's lines, twenty-five barrels of lime, weighing 5,000 lbs., on which it was charged a rate of 21 cts. per cwt., making a total freight charge thereon of $10.50; that on the same day it shipped from Oakfield, Wis., to Mountain, Wis., six sacks of hydrate lime, weight 600 lbs., on which it was charged a rate of 34 cts. per cwt., the total freight charges thereon amounting to $2.04; that the freight charges on the foregoing shipments have been paid; that the rates exacted for the transportation of such freight were unusual and exorbitant; wherefore, petitioner prays for a refund in such amount as shall be reasonable and just.

The respondent railway company admits the formal allegations of the petition, and alleges that the petitioner is a shipper of lime in sacks in less than carload lots over respondent's lines in Wisconsin, and that it made the shipments which are referred to in the petition; that the charges assessed were as therein stated, but respondent denies that the said charges were unusual and exorbitant, and on the contrary alleges that the rates charged were reasonable; that there should be no order made herein finding said rates unreasonable and excessive, and that the said petition should be dismissed.

The matter came on for hearing on June 21, 1909. The petitioner did not appear and was not represented. The respondent was represented by *S. A. Lynde,* its general attorney.

Western classification No. 46, in effect when the shipments in question moved, provided that lime in sacks, shipped in less than carload lots, take second class rate. According to the tariffs on file the second class freight rate from and to points named as to the first shipment above mentioned, was 43½ cts. per cwt., as per respondent's tariff G. F. D. No. 8437, effective Sep. 9, 1906, and still in effect when the shipments moved. The weight as shown being 5,000 lbs., should have been assessed at the rate of 43½ cents per cwt., making a charge for the shipment of $21.75, or $3.25 less than was actually charged.

The shipments from Oakfield to Mountain, April 17, 1909, consisted of twenty-five barrels of lime, weighing 5,000 lbs., which at fourth class rate of 21 cts. per cwt. applicable thereto, makes the charge $10.50 for such shipment. This we understand to be the correct charge. As to the six sacks of hydrate of lime, weighing 600 lbs., if charged at the rate of 34 cts. per cwt., would make a total charge of $2.04. Hydrate of lime was not specified in western classification No. 46 and would therefore take the rate provided for lime in sacks, which was second class, or 34 cts. per cwt., as billed.

The question of a change in the western classification was taken up with the various lines interested, and also with the chairman of the classification committee, with the result that, effective Nov. 1, 1909, western classification No. 47 provides for hydrated and ground lime in paper bags, enclosed in burlap sacks, shipped in less than carload lots, taking fourth class rate. If this rate were applied to the second shipment of six sacks of hydrated lime, it would have the effect of reducing the rate from 34 cts. to 21 cts. per cwt., and the charges from $2.04 to $1.26 for the shipment. The following statement shows the amount collected by the respondent upon the foregoing shipments and the amount of the overcharge thereon;

From Oakfield, Wis., to	Statement of billing as collected.						Statement, if charged in accordance with classification No. 47.		
	Date.	Waybill.	Commodity.	Weight.	Rate.	Charges.	Rate.	Charges.	Over-charges.
Hackley, Wis..	Apr. 10, '09.	57	28 sks. ground lime	5,000	50	$25.00	25	$12.50	$12.50
Mountain, Wis.	Apr. 17, '09.	91	25 brls. lime........	5,000	21	10.50	21	10.50	......
			6 sks. lime.........	600	34	2.04	21	1.26	.78
									$13.28

We find and determine that the rates exacted of the petitioner by the respondent for the aforesaid shipments were unusual and exorbitant, and that the reasonable rates that should have been charged for such shipments are charges designated in the foregoing statement of billing.

Now, Therefore, it is Ordered, That the Chicago & North Western Railway Company be and the same is hereby authorized and directed to refund to the Standard Lime & Stone Company the sum of $13.28, on account of overcharges on the above mentioned shipments.

IN RE INVESTIGATION, ON MOTION OF THE COMMISSION, OF THE RATES, RULES AND REGULATIONS OF THE MADISON GAS AND ELECTRIC COMPANY.

Decided July 5, 1911.

Proceeding on motion of the Commission involving gas and electric rates. An analysis is made of the earnings and operating expenses of the company since the previous decision, 4 W. R. C. R. 501, and comparisons made between such earnings and expenses and the data on which the former order was based. Reductions are ordered for the incandescent lighting service. No changes are made in the electric arc, electric power or gas service. Extensive additions are in process of construction in the gas department and until these have been placed on a fair earning basis a reduction would not be warranted.

A decision and order of the Commission in the case of *State Journal Printing Company et al. v. Madison Gas and Electric Company*, 4 W. R. C. R. 501, dated March 8, 1910, made effective certain reductions and readjustments of the then existing schedule of rates, rules and regulations of that company for gas and electric service.

These changes involved the substitution of a rate based upon the connected load as well as the amount of current used in place of a schedule based entirely upon the current consumed, with a discriminatory discount for quantity. The maximum rate was reduced from 16 to 14 cts. per kw. hr. In the gas rates changes were made in the number of thousand feet sold taking the maximum, secondary, and minimum rates, and the maximum rate was reduced from $1.25 to $1.15 per M.

It is difficult to determine in advance the results of changes as sweeping as these, involving as they do an underlying basis of utility's charge. There was offered in evidence, however, a complete record of the charge for gas and electric service to each consumer covering the year ending Dec. 31, 1907, this being the year in which the complaint was originally lodged, and this became the basis of determination as to how the company would fare under the proposed rate.

A new schedule was placed in effect on April 1, 1910, and since that date the Commission has inquired from time to time as to the progress of gross earnings.

On June 16 notice of a new investigation on the motion of the Commission was served upon the respondent company. A copy of the revised valuation of date March 31, 1911, was transmitted on June 22. On June 24 the following stipulation, made by the attorneys for the city and the company, was received:

"A public hearing in the above entitled matter is hereby waived, subject to the right of either party after a determination by the Commission to a rehearing upon the matters so determined, if either party desires such rehearing.

Dated June 23, 1911.

(Signed) OLIN & BUTLER,
Attorneys for Company.
JOHN A. AYLWARD,
City Attorney."

The questions of law and fact as to the basis of rates which shall be both reasonable to the public and the utility, i. e., as to the value of the property used and useful upon which the utility is entitled to earn a reasonable return; as to the earnings and expenses properly borne by the gas and electric business; as to the allowance for depreciation, interest and profits; and as to the factors properly considered is assessing the total cost of service upon the separate classes of consumers, are fully discussed in the preceding lengthy report and decision. In the present case it is only necessary to note changes which have occurred during the year during which the Commission's rate has been in effect and point out similarities and differences when the principles already passed upon are applied to a new set of facts. In order to facilitate comparison of the company's present operating and financial condition with that existing at the time of the previous decision, tables have been prepared similar in form to those appearing in the former case.

Changes in the company's financial condition are indicated by a comparison of the last balance sheet published in the previous decision, page 564, of date Dec. 31, 1908, and the balance sheet of date March 31, 1911. Comparison indicates an increase in the plant account of $126,204, much of which has apparently been brought about through increases in surplus, aggregating $110,560. Bonds have increased $227,000, but this item is directly offset by the wiping out of $100,000 debenture scrip, $42,000 certificates of indebtedness, and $100,000 bills payable.

TABLE I.

COMPARATIVE BALANCE SHEET.

	Dec. 31. 1908.	Mar. 31, 1911.	Increase.*
ASSETS.			
Plant account close of year	$1,322,340 82	$1,448,544 46	$126,203 64
Storehouse and supply account	27,071 08	37,378 86	10,307 78
Accounts receivable	52,701 93	43,717 04	*8 984 89*
Special expense account		3,352 00	*3,352 00*
Cash	8,256 89	39,458 66	31,201 77
Total assets	$1,410,370 72	$1,565,747 02	$155,376 30
LIABILITIES.			
Capital stock	$400,000 00	$400,000 00	
Bonds	400,000 00	627,000 00	$227,000 00
Debenture scrip	100,000 00		*100 000 00*
Certificate of indebtedness	42,000 00		*42,000 00*
Bills payable	100,000 00		*100,000 00*
Accounts payable	7,948 34	24,654 28	16,705 94
Coupons and interest paid	7,500 00		*7,500 00*
Unpaid wages and salaries	2,543 61	3,360 32	816 71
Unpaid taxes	7,753 00	3,667 18	*4,085 82*
Consumers deposits	247 50	1,982 50	1,735 00
Employes deposits		967 91	967 91
Reconstruction reserve	54,000 00	113,655 97	59,655 97
Profit and loss	279,898 75	390,458 86	110,560 11
Special accounts	8,479 52		*8,479 62*
Total liabilities	$1,410,370 72	$1,565,747 02	$155,376 30

*Italic figures denote decreases.

Changes in the operating returns are given in the comparative income account, table II, which it will be noted is similar in form to the tables given on page 620 of the previous decision. The year Dec. 31, 1909, was the last calendar year in which the previous rates were in effect. Since that date the gas output has increased 14.63 per cent. Gas revenues due to the cut in rates have increased only 8.03 per cent. Electric output has increased 16.28 per cent; electric earnings, 12.95 per cent. Expenses incurred by the gas department have kept direct pace with earnings, increasing 12.37 per cent. Expenses incurred by the electric department have increased only 2.98 per cent. The value of company's property since the date of the last valuation has increased 12 per cent in the electric department and 7 per cent in the gas department. Net earnings for the year have increased but .08 per cent in the gas, but have increased 24.18 per cent in the electric department.

TABLE II.

INCOME ACCOUNTS, BOTH GAS AND ELECTRIC PLANTS.

	Year Ending			
	Dec. 31, 1908.	Dec. 31, 1909.	Dec. 31, 1910.	March 31, 1911.
Earnings.				
Gas	$135,292	$143,459	$152,867	$154,975
Electric	190,873	208,855	233,796	235,898
Total	$326,165	$352,314	$386,663	$390 873
Operating Expense.				
Gas	$93,066	$89,512	$100,442	$100,584
Electric	110,066	110,648	114,312	113,943
Total	$203,132	$200,160	$214,754	$214,527
Net earnings available for depreciation and return upon investment:				
Gas	$42,226	$53,947	$52,424	$54,391
Electric	80,807	98,207	119,484	121,955
Total	$123,033	$152,154	$171,908	$176,346

It is of interest to note how closely the estimates originally made of the anticipated cut in net revenues have been borne out in the net income as stated above. Applying the unit revenues realized in the year ending Dec. 31, 1908, and June 30, 1909, to the sales for the year under which the new rates have been effective, we note a decrease in revenues for gas and electric sales of $18,802 and $18,308, respectively. Of this amount on a 1908 basis $9,431 was a decrease occuring in electric sales due to the new rate, and $9,371 a decrease due to gas sales. The decrease in earnings on the basis of this year was estimated in the previous decision for the electric department on page 723 as $11,429 and for the gas department on page 743 as $6,896, a total of $18,325, as against the $18,802 noted above. Similarly the total anticipated cut for the year ending June 30, 1909, was $18,881, as against the $18,308 noted above.

The additions to company's property since our last physical appraisal, Dec. 31, 1908, as given on page 556 of the previous decision, has been revised for additions and deductions since that date. For the date March 31, 1911, the cost of reproduction new of electric property was $640,048, and the present value $538,331. The cost of reproduction new of the gas plant was $440,023, and present value $379,575. To this sum additions should be made for working capital. Details of the valuation as revised are given below:

COST OF REPRODUCTION NEW AND EXISTING VALUE OF THE MADISON GAS AND ELECTRIC LIGHTING PLANTS,

May 31, 1911.

	GAS PLANT.		ELECTRIC PLANT.		TOTAL.	
	New.	Existing	New.	Existing	New.	Existing
1. Land	$38,600	$38,600	$26,400	$26,400	$65,000	$65,000
2. Intakes	4,264	4,253	4,264	4,256	8,528	8,512
3. Holders	39,011	35,495	....	....	39,011	35,495
4. Distribution system	195,085	162,381	185,991	153,297	381,076	315,678
5. Power plant equipment	73,953	63,885	276,545	229,866	350,498	287,751
6. Buildings	19,473	14,048	58,516	54,838	77,989	68,886
7. Office furn. and appl.	2,371	1,941	2,348	1,918	4,719	3,859
8 Tools	1,833	1,088	2,323	1,538	4,156	2,626
9. Horses, wagons, etc.	4,963	3,884	1,217	963	6,180	4,847
Total items 1—9	$379,553	$325,578	$557,604	$467,076	$937,157	$792,654
10. Add 12% (see note)	45,546	39,069	66,912	56,049	112,458	95,118
Total items 1—10	$425,099	$364,647	$624,516	$523,125	$1,049,615	$887,772
11. Stores and supplies	14,924	14,924	15,532	15,206	30,456	30,130
Total items 1—11	$440,023	$379,571	$640,048	$538,331	$1,080,071	$917,902

NOTE—Addition of 12% to cover cost of engineering, supervision, interest during construction, contingencies, etc

It appears also from the contracts and records examined at the office of the company that extensive additions to the plant are contemplated during 1911. The erection of a new gas holder and extension of distribution mains across the Yahara river, together with the usual additional costs for miscellaneous station apparatus, services and meters, it is anticipated will increase company's capital expenses for the year in the gas department about $112,000. In the electric department the laying of underground conduit on State, Park, East Main, and Webster streets, with the necessary cross street laterals and outlets, together with the usual additions, meters, miscellaneous apparatus, which extensions it is estimated will increase capital expenditures for the year about $77,000.

A detailed examination of the cost of services as compared in the gas and electric department are given below.

GAS DEPARTMENT.

Some idea of the progress in the gas business may be obtained from a comparison of unit operating revenues and costs, such as contained in table III. The figures given for the year ending Dec. 31, 1909, represent returns and expenses just prior to the decision of the Commission making a reduction in rates. Since that date unit revenues for illuminating and domestic fuel have decreased from $1.157 to $1.099 per M sold; those for industrial fuel have decreased from $1.041 to $0.945; those for power have decreased from $1.087 to $0.978. Total gross earnings have decreased from $1.162 to $1.094 per M sold. Operating expenses per unit have decreased but slightly. The reported cost of manufacturing and distributing gas have increased from $0.5182 to $0.5301 per M sold. Collection and general expenses have decreased from $0.2066 to $0.1802 per M sold. Total operating costs have decreased from $0.7248 to $0.7103 per M sold.

TABLE III.

GAS PLANT UNIT OPERATING REVENUES AND COSTS PER M SOLD.

	Dec. 31, 1907.	Dec. 31, 1908.	Dec. 31, 1909.	Dec. 31, 1910.	Mar. 31, 1911.
Illuminating and domestic fuel	$1.1705	$1.1635	$1.1568	$1.1138	$1.099
Industrial fuel	1.0765	1.0383	1.0408	.9667	.945
Power	1.1640	1.1304	1.0870	1.0070	.9784
Total	$1.1652	$1.1574	$1.1568	$1.1077	$1.092
Add forfeited discount	.1022	.0151	.0121	.0075	.0068
Total	$1.1774	$1.1725	$1.1689	$1.1152	$1.099
Deduct bad debts	.0232	.0098	.0073	.0044	.0042
Total	$1.1542	$1.1627	$1.1616	$1.1108	$1.0944
Gross earnings	$1.1542	$1.1627	$1.1616	$1.1108	$1.0944
Operating expenses	.8708	.8216	.7248	.7299	.7103
Net earnings	$0.2834	$0.3411	$0.4368	$0.3809	$0.3841
Detail of operating expenses.					
Manufacturing	$0.3948	$0.4138	$0.3705	$0.4026	$0.3875
Distribution	.2148	.1723	.1477	.1442	.1426
Collection	.0486	.0406	.0438	.0379	.0374
General	.2127	.1949	.1628	.1452	.1428
Total	$0.8709	$0.8216	$0.7248	$0.7299	$0.7103

When operating expenses are divided between consumer and output on the basis suggested in the former case, page 726 and following, almost identical results are obtained. In the analysis of costs for the year ending June 30, 1909, it was found that 22.33 per cent of the total cost varied with the number of consumers, and that 77.67 per cent varied with gas sales. In the analysis made below for the year ending March 31, 1911, 22.51 per cent are found to be consumer, and 77.49 per cent output expenses.

TABLE IV.

APPORTIONMENT OF EXPENSES FOR THE GAS PLANT BETWEEN CONSUMER AND OUTPUT EXPENSES.

Year ending March 31, 1911.

Classification.	CONSUMER.		OUTPUT.		Total.
	Per cent.	Amount.	Per cent.	Amount.	
Manufacture	....	....	100.00	$62,082 42	$62,082 42
Distribution	75.94	$9,863 96	24.06	3,125 03	12,988 99
Collection	100.00	5,298 91	....	....	5,298 91
Total direct expenditures	18.87	$15,162 87	81.13	$65,207 45	$80,370 32
General	..	2,235 01	..	9,609 22	11,844 23
New business	..	211 82	..	910 72	1,122 54
Total above	....	$17,609 70	....	$75,727 39	$93,337 09
Taxes	28.10	1,329 57	71.9	3,402 00	4,731 57
Depreciation	36.72	3,297 12	63.28	5,681 96	8,979 08
Interest and profits	28.10	9,461 71	71.90	24,209 84	33,671 55
Bad debts	18.87	113 22	81.13	486 78	600 00
	....	$31,811 32	....	$109,507 97	$141,319 29

Summarizing this expense division upon a unit basis, we note that costs per consumer for the past year aggregate 54.76 cts. as against 51.72 cts. found for the year ending June 30, 1909, given on page 736 of the previous case. Output costs aggregate 77.34 cts. as against 79.24 cts. found in the former year.

GAS UNIT COSTS.

Year Ending March 31, 1911.

Class of expense.	Unit.	No. of units.	Total cost.	Unit cost.
Consumer	Meter mos	58,092	$31,811 32	$0.5476
Output	M cu. ft	141,597	109,507 97	.7734
Total	M cu. ft	141,597	$141,319 29	$0.998

Direct comparison can likewise be made for the per M sold for the various amounts of gas consumed for the month, appearing on page 737 of the previous case. It is found that here the cost per M cu. ft. in the former case ranged from $1.31 where only one thousand feet are used per month, to $0.79 where one million feet are used, that present costs vary in a similar manner from $1.32 to $0.77 per M sold. Details of these costs follow in table V:

TABLE V.

COMPARISON OF COST PER UNIT FOR GAS SERVICE IN PRESENT AND PREVIOUS CASE.

Cu. ft. per mo.	*Year ending March 31, 1911.*				*Year ending June 30, 1909.*			
	Consumer cost.	Output cost $0.773+ per M.	Total cost.	Total cost per M cu. ft.	Consumer cost.	Output cost $0.7924 per M.	Total cost.	Total cost per M cu. ft.
1 M...	$0.548	$0.773	$1.321	$1.321	$0.517	$0.792	$1.310	$1.310
1.5 M.	"	1.160	1.708	1.139	"	1.189	1.706	1.137
2 M...	"	1.547	2.095	1.048	"	1.585	2.102	1.051
3 M...	"	2.320	2.868	.956	"	2.377	2.894	.965
4 M...	"	3.094	3.642	.910	"	3.170	3.687	.922
5 M...	"	3.867	4.415	.883	"	3.962	4.479	.895
10 M...	"	7.734	8.282	.828	"	7.924	8.441	.844
25 M...	"	19.335	19.883	.795	"	19.810	20.327	.813
50 M...	"	38.670	39.218	.784	"	39.620	40.137	.803
100 M...	"	77.380	77.888	.779	"	79.240	79.757	.798
250 M...	"	193.850	193.898	.776	"	198.100	198.617	.794
500 M...	"	386.700	387.248	.774	"	396.200	396.717	.793
1000 M...	"	773.400	773.948	.774	"	792.400	792.917	.793

ELECTRICAL DEPARTMENT.

The analysis of the electrical department costs discloses somewhat different results. Table VI compares operating revenues and costs per kilowatt hour sold since Dec. 31, 1907. Decreases are noted for the year ending March 31, 1911, over the year ending Dec. 31, 1909, amounting to from 5.69 cts. per kw. hr. to 5.60 cts. for arc lighting, of from 9.78 to 9.31 cts. for incandescent lighting, and of from 5.63 cts. to 5.55 cts. for power service per kw. hr. sold. Total gross earnings have decreased from 6.50 cts. to 6.30 cts. per kw. hr. sold. Operating expenses likewise show a decrease of from 3.44 cts. to 3.05 cts. per kw. hr. sold, while generating expenses are the same for both 1909 and 1911; distribution, collection and general expenses all contribute to the total decrease. Net earnings show a corresponding increase of from 3.06 to 3.25 cts.

TABLE VI.

ELECTRIC PLANT.—UNIT OPERATING REVENUES AND COSTS IN CENTS PER KW. HR. SOLD.

Electric.	Dec. 31, 1907	Dec. 31, 1908	Dec. 31, 1909	Dec. 31, 1910	Mar. 31, 1911
Arc	5.93	5.74	5.69	5.63	5.60
Incandescent	10.06	9.74	9.78	9.54	9.31
Power	5.54	5.78	5.63	5.49	5.55
Total	8.74	8.56	8.50	8.24	8.13
Traction	1.65	1.75	1.75	1.75	1.75
Steam heat	.02	.02	....	....	....
Total	6.34	6.29	6.51	6.38	6.80
Forfeited discount	.02	.02	.02	.02	....
Total	6.36	6.31	6.53	6.40	....
Deduct bad debt	.07	.04	.03	.02	....
Total	6.29	6.27	6.50	6.38	6.30
Gross earnings	6.29	6.27	6.50	6.38	6.30
Operating expenses	4.03	3.65	3.44	3.12	3.05
Net earnings	2.26	2.62	3.06	3.26	3.25
Detail of Operating Expenses:					
Steam heat	.02	.02	....	....	....
Generation	2.09	1.82	1.59	1.66	1.59
Distribution	1.20	1.02	1.10	.80	.81
Collection	.14	.13	.16	.14	.14
General	.58	.66	.59	.52	.51
Total	4. 3	3.65	3.44	3.12	3.05

Dividing operating expenses over consumer, demand and output, as explained in detail in the previous decision, page 664, the following changes are noted: Where in the 1908 calculations consumer costs aggregate 16.14 per cent of the total, those found for the year ending March 31, 1911, amount to 16.19 per cent; demand expenses for the same period have decreased from 21.84 per cent of the total to 20.43 per cent; output expenses have increased from 62.02 per cent to 63.38 per cent.

Comparing the division of costs given in columns 15, 16, 17, 18, we find that the total expense for arc lighting, which in 1908 aggregated 10.40 per cent of the total, now amounts to 9.63 per cent. The total incandescent service expense, which amounted to 65.53 per cent in the former year, now aggregated 65.67 per cent; power service expense, which amounted to 12.90 per cent, now aggregates 13.67 per cent; and street railway expense, which amounted to 11.17 per cent, now aggregates 11.03 per cent.

TABLE VII.

APPORTIONMENT OF EXPENSES FOR THE ELECTRIC DEPARTMENT BETWEEN CONSUMER, DEMAND AND OUTPUT.

Year ending March 31, 1911.

	GRAND TOTAL.	SUBTOTAL.			CONSUMER.		
		Consumer.	Demand.	Output.	Incandescent.	Power.	Arc.
Generation	$71,544 35	....	$10,774 58	$60,769 77	....	....	$764 52
Distribution	18,091 97	$7,128 24	5,158 02	5,805 71	$6,362 67	$765 57	2,291 28
Collection	5,235 02	5,235 02	....	....	4,931 91	303 11	....
Total direct expenses	$94,871 34	$12,363 26	$15,932 60	$66,575 48	$11,294 58	$1,068 68	$3,005 80
General	13,982 71	1,821 95	2,347 70	9,813 06	1,664 53	157 42	443 01
New business	723 51	94 27	121 48	507 76	86 13	8 14	22 92
Total operating expenses	$109,577 56	$14,279 48	$18,401 78	$76,896 30	$13,045 24	$1,234 24	$3,471 73
Taxes	6,882 50	1,325 89	1,699 98	3,846 63	1,158 75	177 14	341 70
Depreciation	30,041 02	6,413 76	7,621 41	16,005 85	5,759 56	654 20	1,690 43
Interest and profits	52,052 88	10,103 46	12,857 06	29,092 36	8,763 74	1,339 72	2,584 27
Bad debts	600 00	101 01	104 40	394 56	91 88	9 16	....
Total expenses	$199,153 96	$32,233 63	$40,684 63	$126,235 70	$28,819 17	$3,414 46	$8,088 13

	DEMAND.				OUTPUT.				SUBTOTAL.		
	Incandescent.	Power.	Railway.	Arc.	Incandescent.	Power.	Railway.	Arc.	Incandescent.	Power.	Railway.
Generation	$7,399 98	$992 34	$1,637 74	$4,065 50	$32,268 75	$10,598 25	$13,837 27	$4,810 02	$39,668 73	$11,590 59	$15,475 01
Distribution	2,394 87	501 87	....	970 71	4,835 00	....	....	3,231 99	13,592 54	1,267 44	....
Collection	....	....	....	....	....	....	....	....	4,931 91	303 11	....
Total direct expenses	$9,794 85	$1,494 21	$1,637 74	$5,036 21	$37,103 75	$10,598 25	$13,837 27	$8,042 01	$58,193 18	$13,161 14	$15,475 01
General	1,443 37	220 21	241 11	742 85	5,468 82	1,562 24	2,039 15	1,185 86	8,576 72	1,939 87	2,280 26
New business	74 69	11 39	12 48	38 44	282 97	80 84	105 51	61 36	443 79	100 37	117 99
Total operating expenses	$11,312 91	$1,725 81	$1,891 33	$5,817 50	$42,855 54	$12,241 33	$15,981 93	$9,289 23	$67,213 69	$15,201 38	$17,873 26
Taxes	996 53	181 90	179 85	406 59	2,229 89	590 07	620 08	748 29	4,385 17	949 11	799 93
Depreciation	4,485 96	701 17	743 85	1,783 05	9,219 37	2,439 29	2,564 14	3,473 48	19,461 89	3,794 66	3,307 99
Interest and profits	8,897 08	1,375 71	....	3,075 06	21,554 53	4,462 77	....	5,659 33	39,215 34	7,178 20	....
Bad debts	91 63	12 77	....	....	321 29	73 27	....	....	504 80	95 20	....
Total expenses	$25,784 11	$3,997 36	$2,815 30	$11,082 20	$76,180 62	$19,806 73	$19,166 15	$19,170 33	$130,783 90	$27,218 55	$21,981 18

If revenues and cost of production as computed in table VII are compared, the greatest discrepancy is noted in incandescent lighting. Total costs here aggregate $130,783.90 as against revenue of $169,657.64. In arc lighting, however, we note a cost of $19,170.33 as against revenue of $16,529.75, and in the power business, both railway and commercial, a cost of $49,199.73 as against a revenue of $49,283.25. These deficiencies in earnings, as has been pointed out in our previous report, page 672, are probably due to inequalities in apportionment. In fact, where the separation of expenses are as involved as in table VII, other bases of dividing expenses are properly employed before definite conclusions can be reached as to what constitutes the cost of services for each particular class.

When the consumer, demand and output costs for incandescent lighting as ascertained in table VII are reduced to a unit basis, somewhat lower costs of service are noted than those for the year ending June 30, 1909, appearing on page 705 of the former case. Consumer costs have decreased from $9.042 per consumer per annum to $7.566. Demand costs have been reduced from 5.55 cts. per active lamp per month to 5.108 cts. Output costs have decreased from 4.52 per kw. hr. to 4.182 cts.

ELECTRIC UNIT COST.

Year ending March 31, 1911.

Class of expense.	Units.	No. of units.	Total cost.	Unit cost year ending March 31, 1911.	Unit cost, year ending June 30, 1909.*
Consumer	Meter	3.809	$28.819 17	$7.566	$9.042
Demand	Active lamp mos.	504.828	25.784 11	5.108 cts	5.55 cts.
Output	Kw. hrs. sold	1,821,374	76,180 62	4.182 cts	4.52 cts.
Consumer plus demand.	Active lamp mos.	504.828	54.603 28	10.82 cts	11.99 cts.
Total	Kw. hrs. sold	1.821.374	130,783 90	7.18 cts	7.782 cts

* See previous decision page 705 ff.

When direct comparison is made with the cost per kw. hr. sold for various hours' use per day, similar to that given on page 706 of the previous case, we note a range in cost per kw. hr. in the present year varying from 11.39 cts. where current is used but one hour per day, to 4.48 cts. where the current is used for twenty-four hours, compared with a range of from 12.65 cts. to 4.86 cts. for the year ending June 30, 1909.

TABLE VIII.

COMPARISON OF COST PER UNIT FOR ELECTRIC SERVICE IN PRESENT AND PREVIOUS CASES.

When current is used	*Year ending March 31, 1911.*			*Year ending June 30, 1909.*		
	Capacity.	Output.	Total.	Capacity.	Output.	Total.
1 hr. av. per day..........	7.21	4.182	11.392	8.13	4.52	12.65
2 hrs. " " "	3.605	"	7.787	4.07	"	8.59
3 " " " "	2.403	"	6.585	2.71	"	7.23
4 " " " "	1.802	"	5.984	2.03	"	6.55
5 " " " "	1.442	"	5.624	1.63	"	6.15
6 " " " "	1.202	"	5.384	1.36	"	5.88
8 " " " "	.901	"	5.083	1.02	"	5.54
10 " " " "	.701	"	4.903	.81	"	5.33
12 " " " "	.601	"	4.783	.68	"	5.20
16 " " " "	.451	"	4.633	.51	"	5.03
20 " " " "	.360	"	4.542	.41	"	4.93
24 " " " "	.300	"	4.482	.34	"	4.86

The above examination of unit costs suggests the following schedule for incandescent lighting.

12 cts. per kw. hr. for the first 30 hrs. use per mo. of active connected load.

8 cts. per kw. hr. for the next 60 hrs. use per mo. for active connected load.

4 cts. per kw. hr. for all additional current consumed.

The effect of such a change in rates is indicated in table IX which compares in detail the analysis of sales made for the year ending Dec. 31, 1907, as given in the previous case on page 720, with those made for the year ending March 31, 1911.

Since 1907 the number of consumers in the residence class has increased 34 per cent, the number of lamps connected 53 per cent, the kilowatt hours sold 70 per cent. Net revenues from residence consumers, due to decrease made in rate, have increased but 35 per cent.

The number of consumers in the B class, consisting of offices, stores, saloons, theaters, etc., have decreased 3 per cent. The total number of 50 watt lamps has increased 0.6 per cent. The number of kilowatt hours sold has increased 25 per cent. The accruing revenue has increased 10.9 per cent.

In class C, consisting of churches, hotels, clubs, factories, etc., the number of consumers has increased 33 per cent. The total number of 50 watt lamps has increased 111 per cent. The total number of kilowatt hours sold has increased 49 per cent. Total revenues have increased 63 per cent.

TABLE

ANALYSIS OF ACTUAL NET REVENUE YEAR ENDING

TOGETHER WITH AN ESTIMATE OF

Rate class.	Consumer class.	Number of consumers.		Total number of 50 W. lamps.		Kilowatt hours sold 1907.			
		1907.	1911.	1907.	1911.	Primary.	Secondary.	Excess.	Total.
A	Residence	2,072	2,778	32,973	50,489	208,937.9	146,966.4	62,408.2	418,312.5
	Per cent					*49.95*	*35.13*	*14.92*	*100*
B	Stores	345	270	7,307	6,600	65,281.1	72,029.9	71,818.6	209,129.6
	Offices	169	206	2,301	2,736	15,227.4	7,061.6	6,707.5	28,996.5
	Restaurants	15	31	423	500	4,464.9	7,252.1	18,367.0	30,084.0
	Saloons	82	61	1,708	1,358	13,199.7	19,208.6	34,979.7	67,388.0
	Lodge and dance halls	20	10	1,065	602	8,511.2	5,655.7	1,934.1	16,101.0
	Laundries	6	8	121	264	1,521.8	2,157.1	922.6	4,601.5
	Passenger depots	6	7	262	377	3,061.8	4,179.5	4,884.4	12,125.5
	Theater	6	6	692	1,076	5,755.6	8,932.0	14,679.4	29,367.0
	Hall lights	15	9	184	39	1,113.0	1,370.5	3,428.0	5,911.5
	Banks		11		287				
	Barber shops		25		302				
	Total	664	644	14,063	14,141	118,136.5	127,847.0	157,721.3	403,701.6
	Per cent					*29 26*	*31.67*	*39.07*	*100*
C	Factories	41	60	1,379	1,874	7,575.6	7,320.5	20,794.9	35,691.0
	Livery stables	23	21	267	270	2,487.0	3,561.6	3,866.9	9,915.5
	Churches	19	25	1,188	1,763	6,856.2	2,508.7	862.6	10,227.5
	Hotels	22	16	817	1,217	7,067.8	10,735.0	35,263.2	53,066.0
	Hospitals		2		174				
	Clubs	5	7	380	647	3,552.9	3,995.6	2,267.5	9,816.0
	Schools	5	6	356	754	1,832.8	709.2	45.0	2,587.0
	Blacksmith shops	5		63		277.4	120.1		397.5
	Carriage shops	2		12		19.5			19.5
	Machine shops	3		34		169.0	146.0	216.0	531.0
	Carpenter shops	6		31		138.4	70.9	2.2	211.5
	County	2	1	100	284	988.8	1,980.0	6,961.2	9,930.0
	Post office	1	1	375	410	3,712.8	7,424.4	10,815.8	21,953.0
	Warehouses		29		1,471				
	Freight depots		3		150				
	Garages		6		148				
	State of Wisconsin		1		1,386				
	Total	134	178	5,002	10,548	34,678.2	38,572.0	81,095.3	154,345.5
	Per cent					*22.48*	*24.99*	*52.53*	*100*
D	University of Wis	1	1	13,570	16,812				113,995.0
E	City lighting	1	1	1,064	1,665	6,746.3	7,849.9	6,752.3	21,348.5
F	Signs and outlines	125	107	1,905.7	1,175				227,241.0
	Grand total	2,997	3,709	68,577.7	94,830	368,498.9	321,235.3	307,977.1	1,338,947.1
	Per cent					*36.93*	*32.20*	*30.87*	*100**

* Deducting "University of Wisconsin" and Signs and Outlines.

IX.

DECEMBER 31, 1907, AND YEAR ENDING MARCH 31, 1911

THE FURTHER REDUCTION MADE.

Kilowatt hours sold 1911.				Net revenues.		Estimated revenue under proposed rate.
Primary.	Secondary.	Excess.	Total.	1907.	1911.	
341,880.0	270,048.0	99,285.5	711,213.5	$59,017 72	$80,527 19	$66,600 86
48.07	*37.97*	*13.96*	*100*	....	....	....
72,332.5	84,733.0	62,153.5	219,219.0	$21,561 68	$20,673 78	$17,944 68
18,300.0	11,389.5	19,967.0	49,656.5	4,255 50	5,20[illegible] 31	3,905 84
5,323.5	8,513.0	31,609.5	45,446.0	2,306 01	3,062 21	2,584 24
15,101.0	21,737.5	25,217.5	62,056.0	5,910 04	5,267 14	4,559 82
6,606.0	5,088.5	129.0	11,823.5	1,954 22	1,373 71	1,204 96
3,239.0	4,632.0	1,837.5	9,708.5	493 67	848 02	832 74
3,726.0	6,926.0	13,243.0	23,895.0	1,033 81	1,772 06	1,530 92
10,808.5	19,375.0	29,244.5	59,428.0	2,399 91	4,608 26	4,016 80
479.5	765.0	3,025.5	4,270.0	615 36	303 28	239 76
3,142.0	4,558.0	2,179.0	9,879.0	....	944 86	828 84
2,432.5	3,318.5	2,476.5	9,227.5	....	896 18	776 44
142,490.5	171,036.0	191,082.5	504,609.0	$40,530 20	$44,951 81	$38,425 04
28.24	*33.89*	*37.87*	*100*	....	....	....
12,154.0	13,569.0	6,824.0	32,547.0	$3,176 64	$3,333 45	$2,816 96
2,364.5	3,226.5	3,728.5	9,319.5	1,090 62	827 04	691 00
9,382.5	1,378.5	103.5	10,864.5	1,206 60	1,459 07	1,240 32
12,218.5	22,128.5	23,828.5	58,175.5	4,218 88	4,694 31	4,189 64
1,704.0	3,296.0	1,984.0	6,984.0	....	617 42	547 52
5,719.5	8,587.5	5,645.0	19,952.0	707 84	1,823 40	1,599 14
3,221.0	637.0	240.5	4,098.5	304 28	526 91	447 10
....	....	....	....	64 54	....	....
....	....	....	....	15 00	....	....
....	....	....	....	79 34	....	....
....	....	....	....	61 76	....	....
2,808.0	4,644.0	2,655.0	10,107.0	719 79	898 54	814 68
4,062.0	8,124.0	14,263.0	26,449.0	567 01	1,876 54	1,707 88
9,110.5	6,673.0	2,287.0	18,070.5	....	1,999 71	1,718 58
1,428.0	2,269.5	3,484.0	6,181.5	....	518 58	452 28
1,348.0	2,334.0	5,225.0	8,907.0	....	653 18	557 48
4,033.1	5,168.1	9,715.8	18,917.0	....	1,802 45	1,286 05
69,553.6	82,035.6	78,983.8	230,573 0	$12,212 30	$19,937 19	$18,368 63
30.57	*35.94*	*33.49*	*100*	....	....	....
....	....	....	216,456.5	$7,410 06	$14,561 72	$12,397 15
8,223.1	5,639.4	3,351.5	17,214.0	1,440 03	1,961 26	1,571 98
....	....	....	141,308.0	14,274 59	7,718 47	6,305 39
562,147.2	528,759.0	372,703.3	1,821,374.0	$134,884 90	$169,657 64	$143,369 05
38.59	*36.24*	*25.17*	*100*	....	....	....

The total business of the company has increased as follows: Number of consumers 25 per cent, total number of 50 watt lamps 44 per cent, total kilowatt hours sold 48 per cent, total revenue 29 per cent. Under the new rate the amount of revenue earnings for the year ending March 31, 1911, will be increased about $26,288.59. This figure is approximate. It will be further increased by the change in active connected load in stores having over fifty 16 c. p. lamps. It will be decreased about $3,000 due to additional revenue from minimum bills. It is safe to state that the net cut in revenues will aggregate $24,000.

From our determination of the facts disclosed from the analysis for the year ending March 31, 1911, it appears that certain changes are properly made in the schedule of rates now existing for incandescent lighting service. No changes appear advisable at this time for electric arc, electric power or gas service, especially in the latter case because of the contemplated extensive additions now in process of completion. Until these shall have been placed on a fair earning basis, a further reduction in rates for this service does not appear to be warranted.

IT IS ORDERED, That the respondent, the Madison Gas and Electric Company, amend its present schedule for incandescent lighting service and place in effect the following rate schedule deemed just and reasonable, as provided in sec. 1797m—46, ch. 499, Laws of 1907.

SCHEDULE OF RATES FOR INCANDESCENT LIGHTING SERVICE.

For all lighting service furnished residences and business places (hereinafter specifically referred to as classes A, B and C) including such incidental use of appliances for heating or power used on lighting circuits, and passing through the same meter and measured by a meter or meters owned and installed by the company, a charge of

Primary rate

12 cts. net or 13 cts. gross per kilowatt hour for current used equivalent to or less than the first thirty hours' use per month of active connected load.

Secondary rate

8 cts. net or 9 cts. gross per kilowatt hour for additional current used equivalent to or less than the next sixty hours' use per month of active connected load.

Excess rate

4 cts. net or 5 cts. gross per kilowatt hour for all current used in excess of the above ninety hours' use per month of active connected load.

For all alternating current furnished the University of Wisconsin (hereinafter specifically referred to as class D), a maximum charge of 5.5 cts. net per active lamp of 50 watts equivalent per month, plus 4 cts. net or 5 cts. gross per kilowatt hour for current consumed, as measured by meters owned and installed by the company.

For all interior lighting furnished the city of Madison (hereinafter specifically referred to as class E), a minimum charge equivalent to the rate specified above for classes A, B and C.

For all signs, outlines and window lighting, on a yearly contract basis (hereinafter specifically referred to as class F), a charge of 4.5 cts. net per active 50 watt equivalent per month, plus 4 cts. net or 5 cts. gross per kilowatt hour for current consumed as estimated according to the schedule of hours of lighting now in use by the company.

Active connected load shall in each case be a fixed percentage of the total connected load, consisting of lamps, appliances, etc., installed upon the consumer's premises.

In class A are included residences, dwellings, flats and private rooming houses. Where the total connected load is equal to or less than 500 watts nominal rated capacity, 60 per cent of such total connected load shall be deemed active; where the installation exceeds 500 watts nominal rated capacity, 33 1/3 per cent of such a part of the total connected load over and above 500 watts shall be deemed active.

In class B, where the total connected load is equal to or less than 2.5 kilowatts nominal rated capacity, 70 per cent of such total connected load shall be deemed active; where the installation exceeds 2.5 kilowatts nominal rated capacity, 55 per cent of such a part of the total connected load over and above 2.5 kilowatts shall be deemed active; provided that lamps used exclusively in space devoted to the storing of goods shall be placed at 20 per cent active and shall not be included in the 2.5 kilowatt hours specified above. Class B shall consist of banks, offices, business and professional (including studios, dressmaking parlors, massage parlors, millinery and hair dressing establishments, and photograph galleries), wholesale and retail merchandise establishments, such as art stores, bakeries, barber shops (including shoe-shining parlors and public baths), book stores, cigar stores, coffee and tea stores, commission stores, confectionery stores (including ice cream parlors), crockery and china stores, dry goods stores, drug stores, electrical supply houses, flower stores (including greenhouses), furniture and house furnishing stores, gents' furnishing stores (including hat stores and haberdasheries), grocery stores, hardware stores, harness shops, hay, grain, feed and coal offices and stores, jewelry stores, meat markets, millinery stores, milk depots, paint and wall paper shops, piano and music stores, picture stores, plumbing shops, saloons (including pool and billiard halls and adjoining card rooms), shoe stores and shoe repair shops, stationery stores, tailor shops (including dyers, cleaners and clothes pressing establishments), undertakers, upholsterers, and wine and liquor stores, theaters (including nickelodeans, shooting galleries, and similar amusement places), corridors and halls in office and apartment buildings upon separate meter, dance and public halls (including lodge and society rooms), restaurants (including eating places and lunch wagons), depots and public places for the conduct of railroad, street railway, express and telephone business (excluding freight warehouses), and all other consumers not herein otherwise specifically provided for.

In class C 55 per cent of the total connected load shall be deemed active. Such class shall consist of federal, state and county buildings; churches and missions; hotels and clubs; factories (including small industrial establishments such as machine shops, carpenter shops, blacksmith shops, tin shops and cigar factories), closing not later than 6 p. m., private and parochial schools; grain and tobacco elevators and warehouses, freight and storage warehouses, and stables and garages, both private, boarding and livery.

In class D 30 per cent of the total connected load shall be deemed active. Such class shall consist of the University of Wisconsin.

In class E 55 per cent of the total connected load shall be deemed active. Such class shall consist of all interior lighting for the city of Madison, including commercial a. c. current for schools, police and fire station, libraries, hospitals and other city buildings.

In class F the total connected load shall be deemed active. Such class shall consist of unmetered lighting for signs, outlines and windows, contracted for upon a yearly basis.

Minimum Bill.

The minimum bill shall be $1.00 net per month.

Where company is unable to read meter after reasonable effort, the fact should be plainly indicated upon the monthly bill, the minimum charge of $1 assessed and differences adjusted with the consumer when meter is again read.

Discount.

Company shall bill all consumers the gross rate, and the difference between the gross and net rates above specified, or 1 cent per kilowatt hour, shall constitute a discount for prompt payment.

Company's present regulation that discounts shall not be granted after the 13th day of the month following the last date of meter reading is deemed reasonable.

Free Maintenance of Lamps.

Company shall renew burned-out or badly dimmed carbon filament lamps of the type originally furnished or installed by the company when returned unbroken to its office. Charges for the maintenance and replacement of other illuminants shall be reasonable and in accordance with the schedule of charges filed with the Railroad Commission.

Re-connection of Meters.

For the re-connection of meters for the same consumer upon the premises a charge of $2 is deemed reasonable.

JOHN RINGLE ET AL.
vs.
CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY,
CHICAGO AND NORTH WESTERN RAILWAY COMPANY,
CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY,
MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY,
GREEN BAY AND WESTERN RAILROAD COMPANY,
NORTHERN PACIFIC RAILWAY COMPANY,
CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY,
ILLINOIS CENTRAL RAILROAD COMPANY.

Submitted May 9, 1911. Decided July 10, 1911.

Petition alleging that the single and double line rates for shipments of tile and brick in Wisconsin, for less than 100 miles, are excessive, discriminatory and unjust; that the total of local rates between points on two different roads are in effect prohibitive; that such rates are not made in five mile distances, as on other building material; that they are higher than the rates in adjoining states, and higher than the rates from such states into Wisconsin.

Numerous comparisons were made with rates applying between various points on brick, tile, etc., and with distance rates in Wisconsin on various commodities.

Held: That the rates at present in effect are higher than the cost to the carrier warrants; that the rates are, generally, higher than those in effect in adjoining states and than the interstate rates into Wisconsin; that, while the carriers should not so adjust their rates as to offset the difference in the cost of production to the different manufacturers, the weaker producers should be granted as favorable rates as those enjoyed by stronger or better situated producers. Respondents are ordered to put into effect a distance tariff on brick and tile, for distances up to and including 100 miles, as stated herein; the joint rates to be one cent per 100 lbs. higher than the single line rate. A distance tariff for distances of from 100 to 300 miles is also given herein, the adoption of which is recommended to the respondent carriers.

The petitioners, brick manufacturers of Wausau, Racine, and Fond du Lac, Wis., acting on their own behalf and as an authorized committee of the Wisconsin Clay Manufacturers' Association, complain of the single line and double line distance rates in effect on brick and tile upon the lines of the respondent companies in Wisconsin, for distances of 100 miles and less.

They allege that the short haul distance rates now in effect are excessive, discriminatory and unjust to the shipper and consumer; that the total of the local rates exacted by said railroads for the transportation of brick and tile between points located on two roads, is in effect prohibitive and grossly unjust; that the rates now in force are not made in five mile distances as on other building material, making the excessive rate more unjust; that much lower rates are made by the respondent railways and other carriers for the transportation of clay products in adjoining states and from such states into Wisconsin; and that such conditions are destructive of the clay industry in Wisconsin, detrimental to its development, and unjust to the petitioners and the people of this state. The petitioners further allege, upon information and belief, that the respondent railway companies have made special commodity rates from and to various points in Wisconsin, much lower than the distance tariff rates, and have made joint rates for the transportation of brick and tile between connecting lines at a rate much lower than the sum of the two local rates, and have refused to make joint rates between other points located on two roads; and that the distance rates on brick and tile in Michigan and Minnesota average from 1 to 1½ cts. per 100 lbs. lower than the distance rates in Wisconsin, while the commodity rates generally applied in Illinois and Indiana are only about one-half to two-thirds of the Wisconsin distance rates. Wherefore, the petitioners pray that rates on brick and tile in five mile distances, as applied to short hauls, be fixed no higher than those given in the following table:

Miles.	Rate.	Miles.	Rate.	Miles.	Rate.	Miles.	Rate.	Miles.	Rate.
5	1.6	25	2.4	45	3.2	65	4.0	85	4.7
10	1.8	30	2.6	50	3.4	70	4.2	90	4.8
15	2.0	35	2.8	55	3.6	75	4.4	95	4.9
20	2.2	40	3.0	60	3.8	80	4.6	100	5.0

The petitioners also pray that joint rates between points on the lines of the various respondents for the shipment of brick and tile be established, equal to the distance rate on one line plus one cent per 100 lbs.

Each of the respondent railway companies, except the Green Bay & Western Railroad Company, made separate answer to the complaint. All of these answers deny that the rates complained of are excessive, discriminatory or unjust. In addition, the answer of the Chicago, Milwaukee & St. Paul Railroad Company denies that rates on its line in Wisconsin are higher than the rates in adjoining states for like distances. The Minneapolis, St. Paul & Sault Ste. Marie Railway Company admits that joint rates should be established on products of the clay industry, but denies that the joint rates proposed in the petition would be reasonable. The Chicago, Burlington & Quincy Railroad Company denies the allegations that its distance rates are not fixed for five-mile distances and cites its G. F. D. No. 35—F, naming rates on brick for five miles.

The hearing was held at the office of the Commission, May 9, 1911. *John Ringle* appeared for the petitioners, *F. G. Wright* for the Chicago, Milwaukee & St. Paul Railway Company, *H. C. Cheney* for the Chicago & North Western Railway Company, and *Jones & Schubring* for the Illinois Central Railroad Company.

The representatives of the petitioners introduced compilations of rates in Wisconsin and adjoining states, showing the relation between the rates complained of and other rates established by the respondents and other railways. He testified that the complaint was based principally upon the rates for distances up to 100 miles, for the reason that the market for brick shipments from the Wisconsin points in which the petitioners were interested, was in general confined to about that distance. The exhibits introduced by the petitioners, comparing the rates complained of with other rates, need not be discussed at length here, since compilations made by the Commission and presented in a later tabulation will cover the same ground. The general result, on a percentage basis, of the petitioners' exhibits may be summarized as follows:

Rates selected for comparison	Percentage relation to Wisconsin distance rates
Michigan distance rates	75
Minnesota distance rates	87
Iowa distance rates	80
Illinois commodity rates (C. M. & St. P.)	66.5
Illinois commodity rates (C. & N. W.)	66.7
Illinois commodity rates from 3 specific points (C. C. C & St. L. Ry.)	55 63 73
Indiana commodity rates from 4 specific points	69 63 64 60
Wisconsin commodity rates from 4 specific points	73 89 91 68
Interstate commodity rates, Chicago to Wis. points (C. M. & St. P.)	72
Interstate commodity rates, Chicago to Wis. points (C. & N. W.)	66

The petitioners' representative, in addition to submitting the exhibits already mentioned, testified that, in his own case, in shipping brick from a point near Wausau, he was obliged to meet Chicago competition; that the ability of the Chicago manufacturers to make brick at a cost of $2 less per thousand than his own cost, and to ship it into his territory at a rate of 9 cts. per 100 lbs., made it necessary for him to cut down his profit to a very small margin; that, although it was possible to obtain joint rates from the various railway companies in his territory by applying for them whenever there was specific occasion to use them, it took some time to obtain them, and therefore prices on brick could not be quoted with a view to such rates.

The existence of lower rates on brick in Illinois, Indiana and other states than in Wisconsin was justified by the witnesses for the respondent companies and by a representative of a Chicago brick factory on the ground that the keenness of competition among the five hundred brick plants in Illinois made it necessary to reduce margins of profit to a minimum and to have the very lowest possible freight rates, and that the density of the traffic and of the population was such that brick could be handled in trainloads and at much lower cost than in Wisconsin. An official of the Chicago & North Western Railway Co offered a statement showing the amount of brick shipped to and from stations in Wisconsin on his line in 1910, as follows:

Brick and tile shipped from Wis. points		Brick and tile shipped to Wis. points	
To	Cars.	From	Cars.
Chicago	87	Chicago	981
Milwaukee	181	Milwaukee	111
Manitowoc	7	Manitowoc	119
Green Bay	17	Green Bay	41
Other C. & N. W. points	1,044	Sheboygan	30
All foreign points	145	Other C. & N. W. points	2,037
Total	1,481	Total	3,319

The same witness testified that Jefferson was the only important Wisconsin point upon the Chicago & North Western line which was given specific commodity rates on brick, such rates having been established some time ago, owing to the long distance over which fuel must be transported to that point; and that the shipments from Jefferson in 1910 were 31 cars to Milwaukee, 89 cars to other Chicago & North Western stations, and 9 cars to foreign points, or 129 cars in all, which was not half as many cars as were shipped by the petitioners' representative alone under the higher rates complained of. It was stated that the brick business in Wisconsin seemed to be prospering under the distance rates complained of, and that the brick manufacturers in northern Wisconsin undoubtedly had an advantage over those in the southern part of the state on account of cheaper fuel. Conditions in the brick industry were such, it was testified, that the manufacturers at some points desired high freight rates so as to keep out competition in the home market, and at other points desired low rates so that they might reach a broader market than their immediate locality.

The statements of the respondents' witnesses as to the prosperity of the brick business in Wisconsin were challenged by the representative of the petitioners, who gave the high freight rates as an important factor in the decrease in the number of Wisconsin brick yards by thirty-one in the three years 1904 to 1907. He denied that this decrease in the number of factories was due, to any great extent, to the increasing use of other building materials such as concrete, and asserted that the consumption of brick throughout the United States had greatly increased in recent years.

At the hearing, the representatives of the Chicago & North

Western and the Chicago, Milwaukee & St. Paul railways offered to compromise the case by putting into effect certain rates which the petitioners had suggested in a letter sent to the respondent companies before the filing of the petition in this case. The rates so requested were somewhat higher than those prayed for in the petition in this case, and ranged from 2 cts. for 5 miles to 4.6 cts. for 75 miles. This compromise offer was not accepted by the representative of the petitioners, who preferred, since the matter was before the Commission and more than his own private interests were involved, to have the Commission fix the rates.

The material presented by the petitioners in the form of compilations of comparative rates has been carefully checked over by the Commission and has been found to be substantially correct. These compilations give a fairly comprehensive view of the rate situation in Wisconsin and adjoining states within the 100 mile distance covered by the petition. The comparisons between different distance rates, no doubt, represent practically the true average relation between those rates, but the comparisons between certain selected specific commodity rates and the Wisconsin distance tariff rates may not represent the true average relation that exists between the distance tariff rates and all the specific commodity rates that may be in force.

Specific commodity rates, as a rule, are based on or made to meet special traffic conditions which are not met by general distance class or commodity rates. These rates are lower, in practically all cases, than general distance tariff rates. The exact difference between them cannot, however, be determined in many cases, for the reason that the specific rates are not usually based on distance as are the distance rates. However, if a sufficiently large number of specific commodity rates are taken, including some that apply in each direction from the shipping point, and on branches, a comparison that is of some value may be made between the distance tariff rates and specific commodity rates which happen to cover like distances.

The Commission has compiled a large number of specific rates that apply between various points on brick, tile, etc., and, for the purpose of comparing them with distance rates, has averaged them according to distance. These average specific rates, together with various distance rates, including those complained of, are shown in table I. The reference numbers at the top of each column are briefly explained by notes at the bottom of the table.

TA

COMPARISON OF VARIOUS DISTANCE RATES AND

Arranged In Order

Selected rates and averages, as

Miles.	Local Wisconsin rates.										
	1	2	3	4	5	6	7	8	9	10	11
5	2	2	2	2	2	2	1.5	2.5	......	......	......
10	3	2	3	3	2	2	2	2.5	2.33	......	......
15	3.4	2.11	3.5	4	3	3	2	2.83	2.7	3	......
20	3.8	2.75	3.5	4	3	3	2	3	3.25	2.75	......
25	4	3.2	4	4.5	3	4	2.16	2.83	3.5	3.5	......
30	4	3.42	4	4.5	3	4	2.5	3.25	3.75	3.66	......
35	4.5	3.64	4.5	4.5	4	5	2.75	3.12	4	4	4
40	4.5	4	4.5	4.5	4	5	3	2.66	4	4	4
45	4.5	4.1	5	5	4	6	3	3.33	4.37	4	6.75
50	5	4.33	5	5	4	6	4	3.37	4.66	3.66	7
55	5	4.67	5	5.5	5	7	4	3.5	4.75	4	7
60	5	4.78	5	5.5	5	7	4	4.75	4.8	4	7
65	5.5	5.31	5.5	6	5	7	4.37	4	5	4	7
70	5.5	5.17	5.5	6	5	7	4.25	4	5	5	7
75	5.5	5.37	5.75	6.5	5	8	4.25	4.62	5.3	......	7
80	6	5.65	5.75	6.5	5	8	4.16	5	5.5	......	7
85	6	5.75	6	7	5	8	4.62	4.7	5.9	......	7
90	6	5.86	6	7	5.5	8	4.16	5	5.8	5	7
95	6	6	6	7.5	5.5	8	4.5	4.75	6	......	7.25
100	6.5	6.15	6	7.5	5.5	9	4.66	5	6	5	7
105	6.5	6.21	6.5	8	6	9	5	5.25	6.5	5	9
110	6.5	6.16	6.5	8	6	9	6	5.5	6.35	6	8
115	7	6.58	6.5	8	6	9	5.16	5.83	6.33	6	8.25
120	7	6.42	6.5	8	6	9	5	5.66	6.5	6	9.25
125	7	6.62	7	8.5	6.5	10	5.5	6	6.64	6	9
130	7	6.73	7	8.5	6.5	10	5.5	6	6.5	6	8.5
135	7.5	7.46	7	8.5	6.5	10	5.75	6.5	6.65	6	9.16
140	7.5	7.35	7	8.5	6.5	10	5.75	6.5	6.5	6	8.16
145	7.5	7.42	7.5	9	7	10	5.83	7	7.5	6	9.5
150	7.5	7.5	7.5	9	7	11	6	7.5	6.25	6	9.75
155	7.5	7.47	7.5	9	7	11	6	7.5	6.87	6	9.5
160	8	7.9	7.5	9	7	11	6	7.5	6.25	6	9.75
165	8	8	8	9.5	7.5	11	......	7.5	6.25	6	10
170	8	8	8	9.5	9.5	11	......	7.5	6.25	6	9.75
175	8.5	8.23	8	9.5	7.5	12	......	......	6.25	6	9.5
180	9	8.61	8	9.5	7.5	12	......	......	6.25	6	9.66
185	9.5	8.71	8.5	10	8	12	......	......	6.25	6	9.5
190	10	8.9	8.5	10	8	12	......	......	6.25	6	9.75
195	10.5	9.55	8.5	10	8	12	......	......	6.25	6	9.5
200	11	10.02	8.5	10	8	13	......	......	6.25	6	9.75

Explanation of

1. Class E. Wis. distance tariff. Applies on brick, minimum 40,000 lbs; drain tile, minimum 30,000 lbs., etc.
2 Average class E rates, locally, all lines, between Milwaukee and all Wisconsin points.
3 Commodity distance rates on brick, etc., locally, on C. & N. W., C. M. & St. P., C. B. & Q., and C. St. P. M. & O. railways.
4 Rate on brick, tile, etc., locally via C. & N. W., jointly via C. & N. W. and C. St. P. M. & O., locally via Chicago division of M. St. P. & S. S. M., locally via I. C. R.R
5 Rate on brick, tile, etc., locally via N. P., locally via Wis. and Pen. divisions (and others) of M. St. P. & S. S. M. R. Co.
6 Class E distance rates on N. P. and G. N. rys., in Wis. Apply same as ref. No. 1.
7 Rates on C. & N. W. on common brick from Wonewoc, Wis., to 73 stations in Wis. compiled on a distance basis.
8 Rates on C. & N. W. locally, on brick and tile, from Jefferson, Wis., to 72 stations in Wis., compiled on a distance basis.
9 Rates on C. St. P. M. & O. locally on brick, tile, etc., from Menomonie and Tramway, Wis., to 147 Wis. points, compiled on a distance basis.
10 Average of 26 rates on brick locally between various points on G. B. & W. R. R., compiled on a distance basis.

BLE I.

SPECIFIC COMMODITY RATES ON BRICK, TILE, ETC.

OF DISTANCES.

explained in notes below.

Ill. to Wis.	Minn to Wis.	Ill. dist.		Illinois.		Indiana		Michigan.		Iowa dist.	Minnesota dist.		Mich dist.
		Brick.	Tile.	Loc.	Jt.	Loc.	Jt.	Loc.	Jt.				
12	13	14	15	16	17	18	19	20	21	22	23	24	25
......	......	2.9	2.755	1.32	......	......	......	2	......	2.8	2	2	......
......	......	3.4	3.23	1.83	......	2.12	......	2.25	......	3	2.7	3	2
......	......	3.5	3.325	2.12	......	2.25	......	2 5	......	3.1	2.9	4	......
......	3	3.8	3.61	2.33	3.5	......	. ....	2.5	......	3.2	3.1	4	2.5
......	4	4	3.8	2.57	3.66	2.08	......	2.92	......	3.3	3.3	4	......
3	......	4.2	3.99	2.83	4	......	......	3.25	......	3.4	3.5	4.5	......
......	4˙5	4.4	4.18	2.87	3.75	2.75	......	3.44	......	3.5	3.8	4.5	......
3.5	4.5	4.5	4.275	3.33	3.83	2.75	......	3.71	4	3.6	4	4.5	3
2 75	4.5	4.7	4.465	3.25	3.5	3	......	4	4	3.7	4.2	5	......
4	......	4.9	4.655	3.35	4	3	......	4	4.33	3.8	4.4	5	......
3.37	5.5	5	4.75	3.5	3.5	3.37	......	4	4.75	3.9	4.6	5.5	......
4.16	......	5.2	4.94	3.66	4	3.5	......	4.05	4.5	4	4.8	5.5	3.5
3.75	......	5.4	5.13	3.66	4	......	......	4.5	5.5	4.1	5	6	......
4.75	6	5.5	5.225	3.75	4	2.91	3.25	4.6	......	4.2	5.2	6	4
4.33	.. ...	5.6	5.32	3.66	4	3.5	......	4.5	5.5	4.3	5.4	6.5	......
5	......	5.8	5.51	3.83	4.5	......	......	5	......	4.4	5.6	6.5	4.5
6.75	......	5.9	5.605	3.75	4.5	3.75	4.12	5	5.5	4.5	5.8	7	..... .
6.83	7	6	5.7	4	4.25	3.87	4	5	......	4.6	6	7	......
5	......	6.2	5.89	4	4.16	4	4	5	6	4.7	6.2	7.5	......
5.25	7.5	6.3	5.985	5	4.56	......	4	5	6	4.8	6.4	7.5	......
6.16	......	6.4	6.08	4	4.5	4.25	4.16	5	6	4.9	6.8	8	......
5.7	......	6.6	6.27	4.16	4.5	4.25	4	5.5	6	5	6.8	8	......
6.25	......	6.7	6.37	5	5	4.75	4	5.5	6	5.1	7	8	......
5.66	......	6.8	6.46	4.25	4.5	4.75	4	5.5	......	5.2	7.3	8	5
6.66	......	7	6.65	3.75	4.5	4.5	4.5	......	6.5	5.3	7.5	8.5	......
5.8	......	7.1	6.745	5	4.25	4.87	4.5	....	......	5.4	7.7	8.5	5.5
6.75	8.5	7.2	6.84	5	5	3.75	4.5	6	......	5.5	7.9	8.5	......
6.66	......	7.4	7.03	5	4.81	5.5	4.5	6	......	5.6	8.1	8.5	......
7	8	7.5	7.125	5	4.81	6	......	......	......	5.7	8.3	9	......
7	9	7.6	7.22	5	4.62	......	4.5	6	......	5.8	8.5	9	6
7	......	7.7	7.315	5	5	......	......	......	......	5.9	·8.7	9	......
7	......	7.8	7.41	......	5.58	......	4.75	......	......	6	8.9	9	......
7	9.5	7.9	7.505	......	5	6	......	......	......	6	9.1	9.5	......
7	......	8	7.6	......	5	.. ...	5	......	......	6	9.3	9.5	......
8	......	8.1	7.695	......	5.16	......	4.83	......	......	6	9.5	9.5	......
7	... ..	8.2	7.79	4	5.41	......	......	......	......	6	9.5	9.5	......
7.5	10	8.3	7.885	......	5 41	......	......	......	......	6.5	9.7	10	6.5
7.4	......	8.4	7.98	4	5.83	......	5	......	......	6.5	9.9	10	......
8	7	8.5	8.075	4	5.75	......	5	......	......	6.5	10	10	......
8	7	8.6	8.17	......	6.12	......	5.5	......	......	6.5	10	10	7

REFERENCE NUMBERS:

13 Average of 21 local rates on brick, tile, etc., via C. St. P. M. & O. Ry. from St Paul, Minn. to Wisconsin points.

14 10th class distance rates in Ill; applies on common brick, min. 24,000 lbs.

15 5% less than 10th class rates in Ill; applies on drain tile, min. 24,000 lbs.

16 Average of 91 local rates in Ill. on brick, tile, etc. via C. & N. W. and C. M. & St. P. rys.

17 Average of 96 joint rates in Ill., on brick, etc., via C. B. & Q., C. & N. W. and A. T. & S. F. rys.

18 Average of 39 local rates in Indiana on brick, etc., via Wabash, C. H. & D., and L. E. & W. rys.

19 Average of 28 joint rates in Indiana on brick, etc., via C. & E. I., Wabash and C. & O. rys.

20 Average of 158 local rates in Michigan on brick, etc., via P. M. and L. S. & M. S. rys.

21 Average of 19 joint rates in Michigan on brick, tile, etc., via P. M. and G R. & I. rys.

22 Distance tariff rates, locally, in Iowa on brick, tile, etc. Joint rates are 80% of sum of local rates.

23 Distance tariff rates, locally, in Minn., on brick, tile, etc., on various lines.

24 Distance tariff rates, locally, in Minn., on brick, tile, etc., via C. St. P. M. & O. Ry.

The rates complained of, as set forth in the petition, are not alike on all the railroads involved in this complaint, and, therefore, are not shown in any one item of the table. The rates shown in item No. 1 are the class E Wisconsin distance rates, and apply on all of the lines involved in this proceeding except the Northern Pacific Railway. The class E Wisconsin distance rates on the Northern Pacific Railway are shown in item No. 6. The rates shown in items Nos. 1 and 6 are the maximum rates on brick, tile, etc., between all points in Wisconsin on the lines involved herein. The minimum weight in connection with these rates is 40,000 lbs. on brick, 30,000 lbs. on drain tile, and 26,000 lbs. on sewer pipe, clay or cement.

The rates shown in item No. 2 of table I are the average, on a distance basis, of all specific class E rates via all lines between Milwaukee and all Wisconsin points within 200 miles of that city. These are maximum, or average of maximum, rates on brick, tile, etc., to or from Milwaukee, and are subject to the same minimum weights as the rates shown in item 1. The notes appended to table I will, it is believed, explain sufficiently the meaning of the remaining items therein.

Taken as a whole, it seems that the rates are lower outside of than in Wisconsin. This fact, though significant, does not prove that the Wisconsin rates are unreasonably high unless it also can be shown that rates outside of Wisconsin are reasonable and that the situation with respect to the density of the traffic and operating conditions generally is about the same in Wisconsin as in the other states mentioned. With respect to the density of the traffic, the situation seems to be this, that brick tonnage is at least as heavy in Wisconsin as in most of the other states named, and that the traffic other than brick is heavier in Wisconsin than the average for the other states. With respect to operating conditions in other respects, it would also seem that conditions in Wisconsin are as favorable as those outside. At any rate, the loading per car and per train appears to be the heaviest in Wisconsin. It is, of course, true that there are sections in Wisconsin where the cost of construction of the roads is comparatively heavy. But the amount by which it exceeds the cost of construction in the other states is probably not great enough to materially affect the fixed charges which enter into the cost of transportation. The interstate rates, or the rates out of and into Wisconsin, are even more significant than the intrastate rates, for the reason that in the former case the conditions are more nearly like those which obtain for the intrastate brick traffic in this state than is true of the latter rates. In addition to this, the interstate brick rates for Wisconsin come into direct competition with the Wisconsin intrastate rates, and commercial conditions are therefore likely to demand that the latter rates should be as low relatively as the former. The interstate rates available for comparison with the rates involved in this complaint are not numerous. Most of them are probably represented by the rates in effect from points in Illinois to points in Wisconsin, some of which are given under item 15 in table I, and most of which also appear to be considerably lower, relatively, than those complained of herein.

Of the Wisconsin rates shown in table I, it will be noted that those given in item No. 5, being the local single line distance rates on brick and tile on the Northern Pacific Railway and the Wisconsin division of the Soo line, are the lowest rates now in effect, and do not vary greatly from the rates prayed for in the petition. The specific commodity rates applying on the Chicago & North Western Railway from Jefferson and Wonewoc, shown under items 7 and 8, are a little lower, in general, than the rates proposed by the petitioners.

Further explanation and comment upon table I is not deemed necessary. Examination and study of it will reveal many points of similarity and difference to which attention has not been called. The variations in rates on the same item, many of them apparently inconsistent, and between rates on different items, are so numerous that the impression resulting from a study of the table may be one of confusion. In addition to the rates themselves, a careful study of the table requires a consideration of the different minimum weights that apply on various articles taking the same rate and on the same article when more than one rate is applicable.

While traffic and other conditions appear to be such as to argue for at least as low rates within this state as the rates into this state and as the rates within the suriounding states, the absolute reasonableness of all of these rates depends very largely upon the cost to the carriers of the traffic involved. That this is the case can hardly be disputed, for the cost of production is the factor which plays the greatest part in nearly all prices. This cost of the traffic is also made the legal basis for rates, for the law provides in substance that under normal conditions the carriers are entitled to such compensation for their services that their receipts from this source as a whole will cover the necessary operating expenses, including reasonable returns upon their investment. This does not mean that if the carriers are entitled to, say 7 per cent for interest and profit above other operating expenses, the rates on each class of traffic or kind of commodity should be so fixed as to yield this amount. It simply means that this is the return that should be obtained from the traffic as whole; that each class or kind of traffic should contribute to this return in proportion to the cost of transportation, modified by the value of the articles carried and other factors. When all the factors which enter into rate making are thus properly taken into account in making rates, it will be found that the rates on high priced articles yield much more than the average return and that the rates on low priced articles yield considerably less than the average return. Under ordinary conditions, however, no rate is or should be made so low that when all the elements are taken into account it is not found to yield enough to cover operating expenses, including something in the way of a return upon the investment.

Brick is a low grade commodity. Outside of sand, clay, certain kinds of stone, logs and other forest products, and certain other commodities of this nature, it is one of the cheapest commodities that is offered for transportation. Some idea of the price of brick and its relation to the prices of various other commodities may be had from the following table:

TABLE II.

PRICES OF COMMODITIES.

TAKEN FROM VARIOUS PUBLICATIONS.

Date, November 1, 1910.

Commodity.	Unit.	Price.	Basis of reduction to lbs.	Price per 100 lbs.
Coke, Connellsville	ton	$1 55	Ton, 2,000 lbs	$0 08
Coal, bituminous	ton	3 225	Ton, 2,240 lbs	13
Brick, common	M	5 50	4 lbs. per brick	14
Iron ore, Bessemer	ton	5 00	Ton 2,240 lbs	22
Coal, anthracite	ton	5 00	Ton, 2,240 lbs	22
Salt	sack	80	224 lb. sacks	36
Potatoes	180 lbs.	1 25		70
Iron, pig, No. 1	ton	15 75	Ton, 2,240 lbs	70
Cement, Portland	bbl.	1 50	200 lbs. per bbl	75
Corn, No. 2	bu.	57	70 lbs. per bu	82
Oats, No. 2	bu.	34	32 lbs. per bu	1 06
Hay	100 lbs.	1 10		1 10
Petroleum, refined	gal.	074	6.4 lbs. per gal	1 16
Lumber, pine	M	30 00	2,500 lbs. per M	1 20
Steel rails	ton	28 00	Ton, 2,240 lbs	1 25
Wheat, No. 2	bu.	96	60 lbs. per bu	1 60
Apples	bbl.	3 00	150 lbs. per bbl	2 00
Flour	bbl.	4 25	200 lbs. per bbl	2 13
Milk	qt.	048	2.15 lbs. per qt	2 22
Paper, news, roll	lb.	026		2 60
Lumber, cedar	100 ft.	8 00	3,000 lbs. per M	2 67
Lead, pig	lb.	044		4 40
Sugar, granulated	lb.	046		4 60
Hemp, manila	lb.	05		5 00
Cattle	100 lbs.	5 50		5 50
Hogs	100 lbs.	6 20		6 20
Beef, carcasses	lb.	095		9 50
Coffee, Rio	lb.	11		11 00
Lard	lb.	1215		12 15
Tobacco, Burley	lb.	13		13 00
Hides, steer, No. 1	lb.	145		14 50
Cotton	lb.	1455		14 55
Wool, Ohio, washed	lb.	29		29 00

From table II it may be seen that few commodities in the price lists are quoted at as low or at lower prices than common brick. It seems to be worth but little more than soft coal. The facts in this table, when taken in connection with the principles stated in the preceding paragraphs, make it quite clear that the rates on brick should be fixed at a point where the receipts therefrom, after having covered operating expenses, will yield less than the average return on the investment.

The cost of transportation depends on many factors and is greatly affected by the loading per car and the risks involved. Brick is a comparatively heavy commodity. The average loading of the same amounts to about 30 tons per carload. As a rule it also moves in carload lots and is loaded and unloaded by the shippers. In this state the brick traffic is moved over divisions where the traffic generally is heavy, as well as over divisions on which the traffic as a whole is comparatively light. Owing to this and other factors, the cost per unit of transporting brick is relatively low.

The approximate cost per unit of this traffic can also be ascertained. As this cost is made up of the expenses of handling the traffic at the terminals and the expenses of moving it between the terminals, it is necessary to apportion not only the total expenses between the various branches of the traffic, but the expenses for each branch between terminal and movement expenses. The proper unit for the terminal expenses is the ton through the loaded car. The proper unit for the movement expenses is the ton per mile. When the operating expenses for 1910 of one of the leading lines in this state are treated in this manner, and when they include interest at about 6 per cent on the present value of the road as computed from the appraisal in this state, it is found that for a carload of 30 tons the average cost per unit amounts to nearly 1.40 cents per cwt. for terminal and to about 0.2 mill per cwt. per mile for movement expenses. These items, therefore, when the movement cost is so adjusted as to cover the increased cost of moving way freight, may be safely used as one of the leading bases upon which to decide this case. These unit costs, when computed into rates, show quite conclusively that the rates complained of in this case are higher than they should be, and that they should be readjusted upon a lower level than the present rates.

The fixing of joint rates between two or more lines for through hauls from points on one line to points on some other line is always a mooted question. Generally speaking, however, it can be said that the basis for joint rates should be the same as that for local rates. That is, they should, as far as possible, be based on the cost of the service as explained above, properly modified, when necessary, by competitive and commercial conditions. Joint rates are ordinarily fixed at a lower figure than the sum of the local rates on each line and at a higher figure than the local rate on one line for a like distance. In this state, where the costs per unit on the various lines do not differ greatly, the cost of the joint traffic would seem to exceed the cost of the local traffic for like distances by an amount that about corresponds to the cost of transferring the freight from one line to another and of handling the joint accounts. For carload freight this cost would seem to consist mostly of switching the car from the train on the track of one line to the train on the track of the other. In some cases this may amount to more than an ordinary switching charge; in other cases, again, it may foot up to less. Much in this respect depends on conditions at the transfer point. In no case, however, is it likely to greatly exceed the terminal cost at one point, which in this case would be about one-half of the terminal cost as given above. In fact, we are of the opinion that the addition of one cent per cwt. to the local rates as fixed for given distances in the order herein will constitute adequate joint rates between two lines for like distances.

It appears from the testimony that the brick manufacturers in this state were carrying on their business on exceedingly narrow margins of profit. In fact, these margins were so small that even slight differences in the freight rates were sufficient to prevent the manufacturers from obtaining contracts for furnishing brick even at short distances from their plants. The principal cause of this condition of things seems to be found in the fact that certain manufacturers outside of this state were in position to turn out brick at a much lower relative cost than the complainants, and in the further fact that the former enjoyed exceptionally favorable freight charges on their products. We do not take the position that the carriers should so adjust their rates as to offset differences in the cost of production, for such practices on the part of the carriers would ordinarily be out of line with public policy as well as contrary to sound economic principles. But we feel that the conditions in question constitute a valid argument in favor of the proposition that the weaker producers should be granted rates that are relatively as favorable as the rates under which the stronger or better situated producers are shipping.

The petition in this case covers the rates up to and including 100 miles. The main reason for thus confining the proceeding to the rates within this distance appears to be that it was not expected that shipments of brick could be made beyond this limit. That such a low grade commodity as brick can ever be shipped long distances, even under the most favorable rates that could ordinarily be considered, is quite improbable. At the same time, it would not seem best, either for the shippers or the carriers on the one hand, or for the public on the other, to confine an entirely new rate schedule to distances within 100 miles. For this reason the rates beyond this limit were in fact included in the investigation of the Commission, and the Commission has found rates for distances up to 300 miles, which it believes should be substituted for those now in effect. These rates are given in connection with the order herein, and it is recommended that they be adopted by the respondents.

The rates suggested in the petition in this case as those which the maximum rates on brick in this state ought not to exceed, while not far out of the way, do not follow the cost curve as closely as rates computed upon the basis outlined above. For this reason mainly, and also because rates computed on the latter basis are more easily brought into harmony with the rates on other commodities, it was thought best in the order herein to use the rates computed by the Commission. It should be stated here, however, that if, in any general revision of the rates in this state by the Commission, it should be found that the rates provided in the order herein require readjustments in order to be brought into closer harmony with other rates, or for other reasons, such readjustments are likely to be made.

Upon the facts which have thus been presented, the findings in this case are, that the rates complained of herein are unreasonably high, and that the rates given in the following order constitute reasonable maximum rates for the services involved.

IT IS THEREFORE ORDERED, That the respondents in this case, the Chicago, Milwaukee & St. Paul Railway Company, the Chicago & North Western Railway Company, the Chicago, St. Paul, Minneapolis & Omaha Railway Company, the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, the Green Bay & Western Railroad Company, the Chicago, Burlington & Quincy Railroad Company, the Northern Pacific Railway Company, and the Illinois Central Railroad Company, discontinue the rates at present in effect upon their respective lines upon shipments of brick and tile made of clay or shale, for distances up to and including 100 miles, and substitute therefor the following rates:

Distances	Cts. per 100 lbs.
5 miles or under	1.70
10 miles and over 5 miles	1.85
15 " " 10 "	2.00
20 " " 15 "	2.15
25 " " 20 "	2.30
30 " " 25 "	2.45
35 " " 30 "	2.60
40 " " 35 "	2.75
45 " " 40 "	2.90
50 " " 45 "	3.05
55 " " 50 "	3.15
60 " " 55 "	3.30
65 " " 60 "	3.45
70 " " 65 "	3.60
75 " " 70 "	3.70
80 " " 75 "	3.80
85 " " 80 "	3.90
90 " " 85 "	4.00
95 " " 90 "	4.10
100 " " 95 "	4.20

Minimum weight, 50,000 lbs., except that in cars of less than 50,000 lbs. capacity the marked capacity shall be the minimum weight.

It is Further Ordered, That the respondents named above make effective between their various lines, for distances up to and including 100 miles, joint rates one cent per 100 lbs. higher than the rates named in the above table.

It is recommended, that the respondents named above discontinue the rates at present in effect upon brick and tile made of clay and shale upon their respective lines for distances between 100 and 300 miles, and substitute therefor the rates named in the following table, and also establish joint rates one cent higher in each case than the rates named below:

Distances	Cts. per 100 lbs.
110 miles and over 100 miles	4.30
120 " " 110 "	4.40
130 " " 120 "	4.50
140 " " 130 "	4.60
150 " " 140 "	4.70
160 " " 150 "	4.80
170 " " 160 "	4.90
180 " " 170 "	5.00
190 " " 180 "	5.10
200 " " 190 "	5.20
210 " " 200 "	5.40
220 " " 210 "	5.60
230 " " 220 "	5.80
240 " " 230 "	6.00
250 " " 240 "	6.20
260 " " 250 "	6.40
270 " " 260 "	6.60
280 " " 270 "	6.80
290 " " 280 "	7.00

Neither the order nor the recommendation herein shall in any way apply to or charge any rate now in effect that is lower than the rates provided by this order.

CITY OF BELOIT
VS.
BELOIT WATER, GAS AND ELECTRIC COMPANY.

Decided July 19, 1911.

The city of Beloit, petitioner, alleged in substance, that the rates charged by the respondent for water, gas and electric service were excessive and yielded an unreasonable return upon a fair valuation of the property of respondent; that respondent unlawfully and unreasonably discriminated in its charges for service in favor of certain large water consumers; that its rate schedules were generally discriminatory and inequitably distributed the cost of service between the several classes of consumers; that the charge for hydrant rental was excessive and unreasonable; and that the services rendered by respondent were generally unsatisfactory and below the proper standards for such services.

The present value of respondent's physical property, as determined by appraisal and subsequent adjustments made necessary by facts revealed in the testimony and by investigation, as of date June 30, 1910, was $815,902, while the cost of reconstruction new was $894,204.

Paving not actually cut through and replaced by respondent was deducted from the tentative valuation. Respondent's book value on June 30, 1910, was $1,696,229.39. Little or no reliable information was available in regard to the original cost of the plants now owned by respondent.

Held: That original cost of the property, subsequent additions to and investment in the plants and the present value and cost of reproduction are elements which must largely determine the investment upon which respondent is entitled to earn a reasonable return. The facts in regard to the financing of the existing organization, the value of its tangible and intangible assets, among other facts, made it appear that the costs shown by the books of the company could not be regarded as of the greatest importance. It was believed, from the facts available, that the cost of reproduction was not far away from the values upon which respondent is entitled to returns that are reasonable under the circumstances.

The plants of respondent were found to be fairly efficiently and economically operated and maintained. The investment in the gas plant, however, appeared to be somewhat larger than conditions called for.

Operating costs must be equitably distributed between the several classes of consumers and rate schedules so constructed as to make each class bear its just share of the total cost of service and to avoid discrimination between consumers, and to encourage the greatest possible development of the business.

Held: The development of respondent's business in all three utilities is comparatively poor. This lack of development is due largely to the design of the rate schedules. Large users have been encouraged by rates which were so low as to throw an unjust burden upon the small consumers and thus tended to discourage small users and prevent a reasonably good saturation of the territory served by respondent's utilities.

Held: It appears reasonably certain that only by fair distribution of the burden of expense between the several classes, and by the granting of reasonable rates to the smaller consumers, can the business be developed and the interests of both the respondent and the public be best served.

Practically no water consumers in Beloit were on a meter basis. The evidence showed an unusually large amount of water wasted. Investigation showed that the placing of a large number of the consumers on a meter basis and the establishing of a fair and reasonable service charge, together with a charge for water consumed would meet the situation and bring about a fair distribution of the burden and an efficient operation of the water utility.

The water utility was found to be reasonably adequate to meet the demands which were put upon it. The services rendered by the respondent in all three utilities were found to be reasonably satisfactory and in conformity with the rules and regulations prescribed for utilities in the state.

The amended petition of the above named city of Beloit and the members of its common council, whose names are subscribed thereto, sets forth:

1. That said city of Beloit is a municipal organization organized and existing under the laws of the state of Wisconsin, having a special charter, and that the aldermen, the other individual signers of this petition, are persons resident within and having their principal places of business in said city.

2. That the above named Beloit Water, Gas and Electric Company is a public utility, organized under and transacting business by virtue of the laws of the state of Wisconsin as a corporation, and as such is the owner and in control of a water, gas and electric plant and equipment and is engaged in the business of furnishing water for domestic and other purposes, and for the producing, transmitting and delivering and furnishing of heat, light and power, by gas and electricity, to and for the public, at the said city of Beloit, in the county of Rock and state of Wisconsin; and that as such public utility said company is subject to the provisions of ch. 499, Laws of 1907.

3. That the petitioners demand that meters be installed, when desired, for the measuring of water, and a reasonable minimum charge established; that said Beloit Water, Gas and Electric Company refuses to install meters for such purpose, unless the minimum charge be fixed at $12 a year for each

meter; and that petitioners believe that said proposed minimum charge is excessive and unreasonable.

4. That said Beloit Water, Gas and Electric Company unlawfully and unreasonably exacts payment in advance of one-quarter of the annual water rate charged each individual user and adds a penalty of 10 per cent in each case if said advance payment is not made by a user within the first ten days of each quarter.

5. That said Beloit Water, Gas and Electric Company unlawfully and unreasonably discriminates in favor of certain of its patrons in said city of Beloit, not granting to all users of water like rates for like service.

6. That the rates charged by said Beloit Water, Gas and Electric Company for water in some cases exceed those which its franchise authorizes it to charge and are excessive, illegal and unreasonable; and that the rates authorized by said franchise are excessive and unreasonable and should be reduced.

7. That many of the mains used for water service by said Beloit Water, Gas and Electric Company are not large enough; that by reason of the small size of said mains, and the manner in which said water plant was originally planned and constructed and is now operated, the pressure and quantity of water furnished at times when water is needed to extinguish accidental fire are insufficient and not such as will permit the fire department of said city of Beloit to do efficient work, thus endangering the property and the lives of the residents of said city.

8. That the rental charged said city of Beloit for each fire hydrant by said Beloit Water, Gas and Electric Company is excessive, unlawful and unreasonable, and should be reduced.

9. That said Beloit Water, Gas and Electric Company unlawfully, unreasonably and without authority refuses to extend its water mains in said city of Beloit, unless it is ordered so to do by the common council of said city, and fire hydrant rental paid by said city for every 500 feet of main on such extension.

10. Petitioners further show that they are informed and believe that the gas manufactured and furnished by said Beloit Water, Gas and Electric Company for heat and light is adulterated and of a poor and inferior quality; that the system of distribution used is crude and the pressure insufficient; that the

meters furnished and provided by said company for the petitioners and its other patrons for the measurement of gas consumed register incorrectly, and usually in favor of said company; that said petitioners and other citizens of Beloit who use the gas furnished by said company are required to pay and do pay said company unreasonable and excessive prices for the same.

11. Petitioners further show that they are informed and believe that the electric light and power service furnished and provided by said Beloit Water, Gas and Electric Company to its patrons in the city of Beloit is inferior; that the meters furnished and provided by said company for the petitioners and its other patrons for the measurement of the electricity consumed, register incorrectly, and usually in favor of said company; that said petitioners and other citizens of Beloit who use the electricity provided and furnished by said company are required to pay and do pay unreasonable and excessive prices for the same.

12. Petitioners further show that the signatures of the mayor and city clerk and aldermen of the city of Beloit are subscribed hereto in pursuance of and in obedience to a resolution adopted and passed by the common council of said city, March 30, 1908, which resolution authorized the filing of this petition and the bringing of the matters herein stated before the Railroad Commission of Wisconsin for investigation and decision.

Wherefore, petitioners pray that the aforesaid Beloit Water, Gas and Electric Company be required to answer the charges herein, and after due hearing and investigation, that an order be made commanding and requiring said company to install meters for the measurement of water, when demanded, and establishing a reasonable minimum charge for water used through such meters; and commanding and requiring it not to collect charges for water in advance, and not to add or exact any penalty in addition to the legal and authorized rates; and commanding and requiring it not to discriminate in favor of any of its patrons in said city of Beloit, granting to all users of water like rates for like services; and commanding and requiring it to charge no greater rates for water than is authorized by the order of this Commission; and commanding and requiring it to reconstruct its water plant to such an extent and to the end that said Beloit Water, Gas and Electric Company will be able to furnish water in such quantities, and with such pressure as it should; and commanding and requiring it to reduce the rental charged said city of Beloit for each fire hydrant; and commanding and requiring it to make such extension or extensions of its water mains in said city of Beloit, upon order of the common council of said city, without insisting upon a fire hydrant or fire hydrant rental for every 500 feet of main on such extensions; and commanding and requiring it to furnish unadulterated gas, with proper pressure, and charge reasonable and fair prices for the same; and commanding and requiring it to furnish gas meters which will register correctly, or as correctly as it is possible for such meters to register; and commanding and requiring it to do such other act or thing as the Commission may deem necessary and just in the premises.

The Beloit Water, Gas and Electric Company, respondent in these proceedings, and hereinafter designated as the company, or respondent, filed an answer to the above petition and complaint of the city as follows:

The respondent, answering the above petition and complaint, respectfully shows:

1. Respondent admits the allegations of paragraph numbered 1 of said petition.

2. Respondent admits the allegations of fact contained in paragraph numbered 2 of said petition.

3. Respondent says that pursuant to a resolution of the common council of said city, a committee thereof opened negotiations with the officers of respondent for the installation of water meters; that in the course of such negotiation discussion was had of a $12 meter rate, but that no definite proposition with respect thereto as applied to all consumers was made, and that said committee after such discussion, and before any determination by the respondent as to the precise terms upon which meters could reasonably be installed for all consumers, discontinued said negotiation, and reported to the common council of said city that it could arrive at no agreement with respondent; that at all such times respondent was operating under a contract with said city, which established flat rates for water service, and which left it optional with respondent whether it would install meters or not, and that neither said committee, nor said city, had any lawful right to demand of respondent the installation of meters, and that the participation by re-

spondent in the negotiation with said committee with respect thereto was wholly voluntary on the part of respondent, and with the desire, if practicable, to meet any reasonable request which might be made by the representatives of the city of Beloit.

4. Respondent admits that it has required payment in advance of one-quarter of the annual flat water rate charged individual consumers, with a penalty of 10 per cent added if payment was not made within the first ten days of each quarter, but denies that such requirement was unlawful or unreasonable, and on the contrary alleges that said regulation was authorized by the terms of said contract with said city, contained in the franchise under which respondent was furnishing water supply.

5. Respondent, according to its best information, belief and judgment, denies the allegations of paragraph numbered 5 of said petition.

6. Respondent denies that any of its rates for water exceed those which the contract contained in its said franchise authorizes it to charge, and denies that its water rates are, as a whole, excessive or unreasonable, and on the contrary alleges that the same are, as a whole, inadequate.

7. Respondent, upon its best knowledge, information and belief denies all the allegations of paragraph numbered 7 of said petition.

8. Respondent admits the allegations of paragraph numbered 12 in said petition. Respondent denies all other allegations of said petition not herein admitted or otherwise answered.

Wherefore, respondent prays that said complaint be dismissed, and that it have such further relief as may be proper.

DESCRIPTION OF PLANTS.

The Beloit Water, Gas and Electric Company was formed in 1906, by the consolidation of the Beloit Water Works Company, the Beloit Gas Light and Coke Company, and the Beloit Electric Company.

The several stations or plants owned and operated by the company are described as follows:

Water:

1. East side pumping station; original water works.
2. West side pumping station; "stone mill" and "red mill."
3. Electric pumping station.

Gas:
1. Old gas plant.
2. New gas plant.

Electric:
1. Old electric plant.
2. New electric plant.

WATER PLANTS.

1. The east side pumping plant is the original water works constructed in 1885. This plant is operated entirely by steam power. The equipment consists of two Smith Vaile, compound, duplex steam pumps, having a nominal capacity of 1,000,000 gallons per day each; one Fairbanks Morse, compound, condensing, duplex steam pump having a nominal capacity of 2,000,000 gallons per day; and one Fairbanks Morse, duplex steam pump with a nominal capacity of 400,000 gallons per day. The source of water supply at the east side pumping station is an open well, fed by a number of drive points driven in the bottom of the open well. In addition there are fourteen driven wells. At this station there is located an elevated reservoir or tank with a capacity of about 100,000 gallons, and also one cement storage reservoir with a capacity of about 400,000 gallons.

2. The west side pumping station is located on the mill race on the west side of the Rock river and is operated entirely by hydraulic or water power. The station is located in two buildings, commonly known as the "red mill" and the "stone mill." The equipment of this plant consists of three duplex power pumps geared to water turbines. The pump located in the "red mill" has a nominal capacity of about 850,000 gallons per day, while the two pumps in the "stone mill" have a combined capacity of about 850,000 gallons. The water supply at this plant is furnished by a number of driven wells.

3. The electric pumping station, as its name implies, is operated entirely by electric power. This station is located at or near the electric plant and receives power from that station. The equipment consists of two centrifugal pumps, direct-connected to electric motors. The water supply is furnished by eight driven wells.

GAS PLANTS.

1. The old gas plant is the one taken over from Beloit Gas Light and Coke Company and is a coal gas plant. The retort house is equipped with two benches of six retorts each, of half depth, with regenerative furnaces, hand stoked; and with two benches of three retorts each, with free fired furnaces, hand stoked. The daily capacity of the benches when in good condition is 55,000 to 60,000 cubic feet of gas for each bench of sixes, and about 20,000 cubic feet for each bench of threes. At this plant there is a 60,000 cubic foot holder.

2. The new gas plant produces water gas and has a nominal capacity of about 200,000 to 225,000 cubic feet of gas per day. The new holder is located adjacent to this plant. The capacity of this holder is about 300,000 cubic feet.

ELECTRIC PLANTS.

1. The old electric plant is operated by both water power and steam power. The boiler equipment consists of a 250 horse power, vertical Wiches boiler. The engine equipment consists of one Vilter Corliss engine, rated at about 350 indicated horse power, and one Hoffman & Billings Corliss Engine, rated at about 125 indicated horse power. The hydraulic equipment consists of one 62-inch vertical Samson wheel and two 60-inch vertical New American wheels. The engines and water wheels are connected to a main counter shaft which is belted to four generators: two 200 kw. machines, one 25 kw. exciter and one 150 kw. machine arranged for use as a motor. There are also three generators in the old station not in use, but in apparently good condition.

2. The new electric station is located immediately north of the old plant. The equipment is modern and the operation is entirely by steam power. The generating equipment consists of one Hamilton-Holzworth steam turbine, rated at 750 brake horse power, direct connected to a 500 kilowatt-ampere, alternating current generator; one 500 kw. turbo-generator, and one 25 kw. turbo-exciter set.

The switchboard for handling the generators of both plants is situated in the new engine room. This board is made up of the usual standard panels for handling the generators and feeder circuits. The distribution for commercial light and power is handled over five feeder circuits, operated at 2,300 volts, 60 cycles, regulated automatically for constant potential. The arc lighting circuits are four in number.

DISTRIBUTION SYSTEMS.

The reports of the company to this Commission for the year ending June 30, 1910, show the distribution systems to be as follows:

Water: 129,046 feet or about 24.4 miles. This is made up of mains from 1¼ inches to 16 inches in diameter; the 4, 6 and 8 inch mains predominating.

Gas: The report shows 28.3 miles of mains varying in size from 1 inch to 8 inches, the 2 inch and 4 inch predominating.

Electric: The report shows 209,505 feet of service wire and 659,810 feet of distribution wire.

CONSUMERS AND OUTPUT.

The total number of consumers taking service from the three utilities on June 30, 1910, was reported as follows:

Water	1,621 (including public)
Gas	1,790
Electric	941

The output of the several utilities was reported as follows:

Water	710,589,986 gallons.
Gas	56,937,900 cubic feet.
Electric	1,612,760 kilowatt-hours.

RATES NOW IN FORCE

WATER DEPARTMENT.

ORIGINAL SCHEDULE (FILED NOV. 20, 1907).

Residence Rates.

	Quarterly	Yearly
Kitchen faucet or first opening, three room house or less	$1.25	$5.00
Kitchen faucet or first opening, four room house	1.50	6.00
" " " " " five " "	1.75	7.00
" " " " " six " " and over	2.00	8.00
Kitchen faucet, without drain	1.50	6.00
Bath tub, first	1.00	4.00
" " each additional	.75	3.00
Closet, first	1.00	4.00
Closet, each additional	.75	3.00
Bowl, each	.50	2.00

	Quarterly	Yearly
Laundry faucet, first	1.00	4.00
" " each additional	.50	2.00
Slop sink, first	1.00	4.00
" " each additional	.50	2.00
Barn opening, with water in house	1.00	4.00
" " only,	Special	
Yard hydrant or sill cock, house use only	1.25	5.00

No additional hydrants allowed on the system.

No additional charge for hot water openings when used in connection with cold city water openings.

Soft water openings supplied by city water motor rated same as though supplying city water for openings used.

Maximum residence rate $40.00 per annum. All openings above this rate free.

All above rates, for one family only.

Sprinkling Rates.

	Quarterly	Yearly
Sill cock, with kitchen faucet, one lot	$3.00	$12.00
From yard hydrant, with house use one lot	2.50	10.00
No house use, one lot, 50 ft. front or less		6.00
Each additional front foot		.10

Water may be used for sprinkling from May 1 to October 1, during the hours of 6 to 8 in the morning and 6 to 8 in the evening, and at no other time. No hose allowed without a ⅛ inch nozzle or other spray device of equivalent capacity.

Flat Buildings.

All openings rated same as regular residences where company assumes vacancies.

Regular rate with 40 per cent discount if owner guarantees vacancies.

This applies only to flat buildings having six or more tenants.

Hotel and Boarding House Rates.

	Quarterly	Yearly
Kitchen faucet, first	$2.50	$10.00
" " each additional	1.60	6.00
Closet, first	1.50	6.00
" each additional	1.00	4.00
Bowls, each	1.00	4.00
Baths, first tub	2.00	8.00
" each additional	1.00	4.00
Slop sinks, each	1.00	4.00
Urinals, each	1.25	5.00
Running water,	Special	
Sill cock	1.50	6.00

Restaurant Rates.

	Quarterly	Yearly
Kitchen faucet, first	$2.50	$10.00
" " , second	1.00	4.00
" " , third and above	.50	2.00
Bowls, each	1.00	4.00
Closet, first	1.50	6.00
" , each additional	1.00	4.00
Urinals, each	1.25	5.00

Business Blocks.

	Quarterly	Yearly
Per tenant, for use of public closet, bowl or closet and bowl	$1.25	$5.00

Office and Store Rates.

	Quarterly	Yearly
First opening, whether bowl or closet	$1.50	$6.00
Second " , " " " "	1.00	4.00
Each additional opening, whether bowl or closet	1.00	4.00
Bowl, closet and sill cock	3.00	12.00
Soda fountain	10.00 to 15.00	
Dentist's cuspidor	1.50	6.00
Vegetable sprinkler, if first opening	1.50	6.00
" " , with other openings	1.00	4.00
Demonstrating tables in grocery stores	1.00	4.00
Refrigerating plants	1.50	6.00

Photograph Galleries.

	Quarterly	Yearly
First faucet opening	$3.00	$12.00
Closet	1.00	4.00
Bowl	.50	2.00
Bath	1.00	4.00

Greenhouses.

	Quarterly	Yearly
One faucet, for sprinkling plants, etc.	$3.75	$15.00

Barber Shop Rates.

	Quarterly	Yearly
First chair and basin	$1.50	$6.00
Each additional chair	.75	3.00
Public bath tub, first	3.00	12.00
" " " , each additional	2.00	8.00
Closet or urinal, each	1.00	4.00
Running water	Special	
Air pump	1.00	4.00

Saloon Rates.

	Quarterly	Yearly
First bar faucet	$3.75	$15.00
Second " "	1.25	5.00
Each additional opening	1.25	5.00

Pop Factory.

	Quarterly	Yearly
First opening	$2.50	$10.00

Livery Rates.

	Quarterly	Yearly
Boarding or sale stables, six horses or less	$3.00	$12.00
Each additional stall	.40	1.60

Lodge Rooms, Dance Halls, Clubs, etc.

	Quarterly	Yearly
First opening	$1.50	$6.00
Each additional opening, if—		
Closet	1.00	4.00
Bowl	1.00	4.00
Urinal	1.00	4.00
Baths, first tub	2.50	10.00
" each additional	2.00	8.00
Shower baths, each	2.50	10.00

Churches.

	Quarterly	Yearly
Organ motor	$5.00	$20.00
Other openings rates same as residence openings.		
Churches having only one opening	Free	
All others, 25 per cent discount from yearly rate.		

Hospitals.

Flat rate of $50.00 per year, last quarter gratis, being 25 per cent discount.

Fountains.

To be used not over 6 hours per day for the season of six months as follows:

1-16 inch jet	$10.00
1-8 “ “	20.00
3-16 “ “	35.00

All water rates are payable in advance within the first ten days of the quarter; 10 per cent will be added if not paid within that time.

Special Rates.

Beloit Box Board Co.	$110.00	per	year
Beloit Iron Works	110.00	“	“
R. J. Dowd Knife Works	25.00	“	“
Berlin Machine Works	140.00	“	“
John Foster Co.	140.00	“	“
Fairbanks Morse Mfg. Co.	225.00	“	month
Lipham Mfg. Co.	23.00	“	year
Inman & Bishopp, cement mfgrs.	15.00	“	“
City Mills	20.00	“	“
C. M. & St. P. Ry. Co.	60.00	“	month
C. & N. W. Ry. Co.	97.83	“	“
Beloit College	300.00	“	year
Goodwin Block	100.00	“	“
Halsey & Hreatsinger, street sprinklers—per wagon	25.00	“	month
Eureka Laundry	25.00	“	year
Parisian “	25.00	“	“
Sam Wah “	20.00	“	“

Building Rates.

Stone, per cord	10 cts.
Brick, per M.	10 “
Plaster, per 100 sq. yds.	15 “
Concrete, per cu. yd.	3 “

Meter Rates.

When the daily consumption is—

100	to	300	gallons, per 1,000 gallons	35 cts.
300	“	1,000	“ “ “ “	30 “
1,000	“	6,000	“ “ “ “	25 “
6,000	“	14,000	“ “ “ “	20 “
14,000	“	30,000	“ “ “ “	15 “
Above		30,000	“ “ “ “	13 “

Amendments.

Nov. 2, 1909—Rate for laundry with following openings:—1 closet, 2 washing machines, $25.00 per year.

July 2, 1909—(1) City cemetery:—Water service from six openings in the city cemetery, to be used for watering the graves by means of sprinkling cans, $40 for the season, May 1 to Sep. 30.

(2) Additional kitchen sinks:—Additional kitchen sinks in residences or premises rated the same as residence, each additional sink, $6 per year.

(3) Small drinking fountains:—In residences or premises rated the same as residences (does not apply to fountains left running continuously), $2 per year.

(4) Water for general uses in hitching barns or stables, $25 per year.

Aug. 12, 1909—Sanitary drinking fountain, running 24 hours per day for the season from April 1 to Dec. 1, $25 for the season.

Jan. 22, 1910—Emergency fire purposes. One 1¼ inch opening in the Wilson Opera House, $8 per year.

Aug. 22, 1910—One bubbling cup or sanitary drinking fountain, $20 per year.

Apr. 30, 1910—Rate to the city of Beloit, for one street sprinkling wagon, ahead of street cleaner, for season from April 1 to Dec. 1, $100 per year.

Apr. 26, 1910—Additional faucets in greenhouses, each $10 per year.

GAS DEPARTMENT.

ORIGINAL SCHEDULE (FILED OCT. 12, 1907).

Under 2,000	cu. ft.	$1.60	per M cu. ft.
2,000–10,000	" "	1.40	" " " "
10,000–20,000	" "	1.30	" " " "
20,000–40,000	" "	1.20	" " " "
Over 40,000	" "	1.10	" " " "

Discount of 10 cts. per M cu. ft. if bill is paid on or before the 10th day of the month following the month in which gas is consumed.

Meter rental of 10 cts. per month.

Minimum monthly bill, 50 cts.

ELECTRIC DEPARTMENT.

Lighting Rate No. 1.

1st 25	kw. hrs.	18	cts. per kw. hr.
2nd 25	" "	15	" " " "
3rd 25	" "	11	" " " "
All over 75	" "	9	" " " "

Discount of 3 cts. per kw. hr. if bill is paid on or before the 10th of the month following the month in which electricity is consumed.

Meter rental of 10 cts. per month.

Minimum bill $1.10 per month, including meter rental.

Lighting Rate No. 2.

Fixed Charge—A fixed charge of 10 cts. per month per 55 watt lamp or less, plus $1.10, less 25 per cent discount.

Current Charge—5 cts. per kw. hr.

Discount of 25 per cent on current charge per month if total bill is paid on or before the 10th of the month following the month in which electricity is consumed.

Minimum monthly bill is the fixed charge.

Note:—The customer has the option of choosing either of the above rates in the down-town business district.

Power Rate.

1st 50	kw. hrs.	10	cts. per kw. hr.
Following 150	" "	6	" " " "
Following 300	" "	4	" " " "
All over 500	" "	3	" " " "

Discount of 10 per cent if bill is paid on or before the 10th of the month following the month in which electricity is consumed.

Meter rental 25 cts. per month.

Minimum bill of $2 per horse power connected.

Municipal Contract Lighting.

Rate as filed Oct. 12, 1907, is as follows:

Dusk to 1:00 a. m.	$60 per year.
Dusk to dawn	80 per year.

VALUATION.

The tentative valuation of the physical property of respondent, as submitted by the engineering staff of the Commission, furnished the basis for the arguments and testimony brought out at the hearings. In connection with the matter of valuation, both petitioner and respondent offered valuations of the several departments made by independent appraisals. All of these inventories are presented in considerable detail and with little departure from the forms and methods adopted by the staff. For this reason it is possible to make direct comparisons of the several appraisals and this is done in the tables which follow. The three departments, water, gas and electric, will be considered separately and items which are common to the several departments, or are general in their nature, will be taken up later.

The tentative valuation of physical property submitted by the staff is of date Jan. 1, 1909. The summary of this appraisal is reproduced in table I which follows:

TABLE I.

TENTATIVE VALUATION OF PHYSICAL PROPERTY.

BELOIT WATER, GAS & ELECTRIC CO.
January 1, 1909.

CLASSIFICATION.	WATER.		GAS.		ELECTRIC.		TOTAL.	
	New.	Existing.	New.	Existing.	New.	Existing.	New.	Existing.
1 Land	$14,822	$14,822	$10,239	$10,239	$7,028	$7,028	$32,089	$32,089
2 Wells and suctions	14,780	14,423	....	....	....	....	14,780	14,423
3 Resev., water tank, holders	14,981	14,066	42,223	40,595	....	....	57,204	54,661
4 Distribution system	133 283	130,081	103,061	96,801	73,360	65,625	309,704	292,507
5 Power plant equipment	26,860	20,355	57,590	53,136	65,399	56,270	149,849	1 9,761
6 Bldgs. and misc. structures	23,334	17,951	31,651	27,357	30,239	18,899	85,224	64,207
7 Office furn. and appliances	979	783	979	783	979	783	2,937	2,349
8 Tools and instruments	931	475	1,627	887	1,464	878	4,022	2,240
9 Horses, wagons and misc.	141	98	843	705	141	98	1,125	901
Total, items 1—9	$230,111	$213,051	$248,213	$230,503	$178,610	$149,581	$656,934	$593,138
10 Add 12% (see note)	27,613	25,563	29,786	27,660	21,433	17,950	78,832	71,176
Total, items 1—10	$257,724	$238,620	$277,999	$258,163	$200,043	$167,531	$735,766	$664,314
11 Stores and supplies	4,170	4,117	13,347	13,282	10,636	10,189	28,155	27,588
Total, items 1—11	$261,894	$242,737	$291,346	$27 ,445	$210,679	$177,720	$763,919	$691,902
12 Paving	12,216	11,429	10,344	9,516	....	....	22,560	20,945
Total, items 1—12	$274,110	$254,166	$301,690	$280,961	$210,679	$177,720	$786,479	$712,847
13 Non-operating property	....	....	....	....	....	....	25,341	21,008
Grand total	....	....	....	....	....	....	$811,820	$733,855

NOTE:—12% added to cover engineering and superintendence, interest during construction, contingencies, etc.

Re-arranging the totals given in the above appraisal, the several departments appear as follows:

	Cost new.	Per cent of total.	Present value.
Water department	$274,110	34.85	$254,166
Gas department	301,690	38.35	280,961
Electric department	210,679	26.80	177,720
Total	$786,479	100.00	$712,847
Non-operating	25,341	....	21,008
Grand total	$811,820	....	$733,855

WATER DEPARTMENT.

In connection with the valuation of respondents water department, six principal appraisals were offered. It has been necessary to make several changes in the arrangements of the items contained in the several valuations, in order that a direct and an effective comparison may be made. The value, of course, remains as presented by the several appraisers. Tables II and III show the reproduction value and present value, respectively, as determined by the several valuations. The items of land and the addition for engineering, superintendence, interest during construction, contingencies, etc., have been omitted and will be taken up later under their proper heads.

TABLE II.

WATER DEPARTMENT—COMPARISON OF VALUATIONS.

COST OF REPRODUCTION.

CLASSIFICATION.	CITY.					Staff's tentative valuation.	Company's valuation.
	Wheeler.	Sturtevant.	Evans.	Fowles	Average of city valuation.		
Wells and suctions..........	$14,780	$14,780	$13 261	$13,153	$13,993	$14,780	$ 9,763
Reservoir and water tank..	12,816	14,981	12,793	14,245	13,708	14,981	17,241
Distribution system.........	106,465	107,383	98,761	101,828	103,609	133,283	150,473
Power plant equipment....	20,094	20,495	17,805	17,821	19,054	26,860	22,482
Bldgs. & misc. structures..	17,647	18,329	14,466	17,113	16,868	23,334	24,873
Office fur. & appliances....	979	979	979	979	979	979	888
Tools and instruments......	93	931	949	949	940	931	1,356
Horses, wagons & misc.. ...	141	141	141	141	141	141	276
Stores and supplies.........	4,109	4,170	4,021	1,427	3,431	4,170	2,857
Total above items.......	$177,962	$182,189	$163,176	$167,656	$175,245	$219,459	$240,209
Paving....................	....	....	....	....	....	12,216	13,743
Total....................	$177,962	$182,189	$163,176	$167,656	$175,245	$231,675	$253,952

Excluding the item paving, the average of the four city valuations is $175,245, the staff valuation is $219,459, and the company $240,209. The difference between the company and the average city value is $64,969; between the staff and the average city value $44,214; between the staff and the company $20,750. The greatest difference between the several valuations occurs in the distribution system, the values being as follows: Average city, $103,609; staff 133,283; and company, $150,473.

It appears from the valuations as above summarized, that as regards office furniture and appliances, tools and instruments, and horses, wagons and miscellaneous, there is essentially an agreement, the differences being so small as to be negligible in their possible effect on the valuation for rate-making purposes.

Turning to the present value, table III gives the values as obtained by the same appraisals as presented in table II:

TABLE III.

WATER DEPARTMENT—COMPARISON OF VALUATIONS.

PRESENT VALUE.

CLASSIFICATION.	CITY.					Staff's tentative valuation.	Company's valuation.
	Wheeler.	Sturtevant.	Evans	Fowles	Average of city valuations.		
Wells and suctions..........	$12,689	$10,436	$11,134	$10,845	$11,275	$14,423	$19,301
Reservoir and water tank..	9,841	9,694	9,848	11,391	10,193	14,066	16,395
Distribution system.........	90,394	91,909	83,199	88,630	88,533	130,081	146,732
Power plant equipment ...	15,105	13,023	11,734	11,764	12,906	20,355	16,186
Bldgs and misc. structures	12,431	12,518	10,182	9,593	11,131	17,951	21,104
Office furniture and appliances........................	783	783	783	783	783	783	773
Tools and instruments	475	475	496	510	489	475	761
Horses, wagons and misc...	98	98	95	98	98	98	217
Stores and supplies..........	4,109	4,117	3,936	1,373	3,391	4,117	2,769
Total above items.......	$145,924	$142,963	$131,440	$134,787	$138,778	$202,349	$224,948
Paving	....	....	....	....	....	11,429	....
Total	$145,924	$142,963	$131,440	$134,787	$138,778	$213,778	$224,948

Here, as in the case of the cost of reproduction, the greatest difference in the valuations occurs in the appraisal of the distribution system. While the difference between the total cost of reproduction new and the total present value (excluding paving) is found by the company to be only $15,261, the average city valuations give this difference as $36,469, and the staff as $17,110. As in the case of the cost of reproduction values, there are several groups in the foregoing present value table, wherein the differences found by comparing the several valuations are so small as to be negligible.

Wells and Suctions.

The following table IV not only shows the values assigned to the wells and suctions by the several appraisals, but also describes the items and gives their location:

TABLE IV.

WELLS AND SUCTIONS.

REPRODUCTION VALUES.

CLASSIFICATION.	CITY.					Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowles	Average of city valuation.		
25 driven wells, west side station	$3,155	$3,155	$2,925	*$1,992	$2,807	$3,155	$3,399
Piping for same	809	809	750	520	722	809	1,967
14 driven wells, east side steam station	1,917	1,917	1,638	1,677	1,787	1,917	2,023
Piping for same, also for open well, reservoirs and tank	3,156	3,156	3,156	3,156	3,156	3,156	3,156
8 driven wells, elec. pumping station	1,170	1,170	1,040	1,043	1,105	1,170	1,275
Piping for same, suction and discharge from pumps	615	615	615	615	615	615	1,003
1 open well, e. side steam sta.	3,681	3,681	2,860	3,500	3,430	3,681	5,477
Roof of same, inside platform, etc	277	277	277	650	370	277	282
Total wells & suctions.	$14,780	$14,780	$13,261	$13,153	$13,993	$14,780	$19,763

*Assumed 17 wells instead of 25.

TABLE V.

WELLS AND SUCTIONS.

PRESENT VALUES.

CLASSIFICATION.	CITY.					Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowles	Average of city valuations.		
25 driven wells, west side station	$2,524	....	$2,340	*$1,594	$2,152	$3,123	$3,365
Piping for same	647	....	660	490	599	802	1,948
14 driven wells, east side steam station	1,725	....	1,360	1,459	1,514	1,859	2,003
Piping for same, also for open well, reservoir and tank	2,840	....	2,841	2,683	2,788	3,061	4,168
8 driven wells, electric pumping station	1,170	....	1,000	1,012	1,060	1,170	1,275
Piping, etc	615	....	615	609	613	615	1,003
1 open well, east side steam station	2,945	....	2,174	2,660	2,593	3,571	5,313
Roof, platforms, etc	222	....	144	338	234	222	226
Total wells & suctions.	$12,688	$10,346	$11,134	$10,845	$11,253	$14,423	$19,301

*Assumed 17 wells instead of 25.

Inspection of the foregoing tables show that there is a substantial agreement between the city and the staff as regards the cost of reproduction of the wells and suctions. The company's valuation is about $5,000 above that of the staff. This amount by which the company's value exceeds the staff value is not due to any differences as regards the value of one or two items in particular, but is due to the placing of a higher value on all the items contained in the group. From a careful examination of the details in the group, and from the testimony bearing on the reproduction values of these items, we believe that the value assigned by the staff should stand.

Coming to the present value of the wells and suctions, a marked difference in the values appears. While the company and the staff have depreciated the group but a small amount, the city has in every valuation made a comparatively large reduction from the cost of reproduction as representing the depreciation of the several items. The difference, then, arises from the fact that the city's experts have assigned a considerably lower percentage condition to the several items. This is particularly true of the wells.

The construction of the wells, their probable useful life, and the questions of proper methods of depreciating such works were all enlarged upon in the testimony on the subject of the present value and percentage condition of the wells.

It is claimed by the city that it is evident from the testimony that the lower percentages of condition, given to the wells by the city's experts, is not a difference due entirely or even mainly to the fact that the city adopted the straight line theory with reference to depreciation. It is due, rather, to essential facts regarding the construction and life of such wells, which were given more consideration and weight by the city's experts than by those of the company.

It is clear that there is involved in this question of present value of the wells and suctions an amount which cannot appreciably affect the final result. It does appear, however, that the weight of the testimony will give a somewhat lower present value than that assigned by the company and the staff.

Reservoirs and Tanks.

The following tables VI and VII present the principal facts relating to the items included in this group, the values assigned to them by the several appraisals, and the percentage conditions:

TABLE VI.

RESERVOIR AND WATER TANK.

REPRODUCING VALUES.

	Reservoir at east side station.	Water tower and tank.	Total.
City:			
Wheeler	$5,043	$7,773	$12,816
Sturtevant	....	....	14,981
Evans	5,683	7,110	12,793
Fowle	5,683	8,560	14,243
Commission's staff	6,968	8,013	14,981
Company	8,050	9,191	17,241

TABLE VII.

RESERVOIR AND WATER TANK.

PRESENT VALUE AND PERCENTAGE CONDITION.

	Reservoir.[1]	Per cent condition.	Roof for reservoir.	Per cent condition.	Water tower.[2]	Per cent condition.	Water tank.	Per cent condition.	Total.
City:									
Wheeler	$4,789	98	....	80	$5,052	65	....	65	$9,841
Sturtevant	....	64.7	....	64.7	....	64.7	....	64.7	9,694
Evans	4,831	85	....	....	5,017	76	....	52	9,848
Fowle	5,399	95	....	....	5,992	70	....	70	11,391
Commissn'sstaff	6,773	99	....	85	7,293	97	....	76	14,066
Company	7,900	99	....	90	8,495	95	....	85	16,395

[1] Includes roof for reservoir.

[2] Includes water tank.

The roof for the reservoir is omitted in the valuations by Fowle and Evans and these appraisals should be increased by about $895. It will be noted that there is but a small difference between the average city reproduction values and those of the staff. The company claims a reproduction value of $17,241, as against the $14,981 used by the staff.

As regards the present values of the items included in the group, a more marked difference is apparent as between the city, the staff and the company. The difference between the city and the staff is largely due to the use of the straight line theory of determining depreciation, as opposed to the sinking fund curve method employed by the staff.

Distribution System.

In tables VIII and IX, which follow, there are presented comparative statements of the cost of reproduction and present value of the water department distribution system as appraised by the city's experts, the staff, and the company. Table IX, which gives the present values, also shows the percentage condition assigned in each appraisal.

TABLE VIII.

DISTRIBUTION SYSTEM.

REPRODUCTION VALUES.

CLASSIFICATION.	CITY.				Average of city.	Staff.	Company.
	Wheeler.	Sturtevant.	Evans.	Fowle.			
Cast iron mains, including specials	$63.937	$54,760	$60.504	$62,145	$60,337	$66,417	$68,224
Wrought iron mains	85	1,362	1,130	80	664	1,319	1,340
Trenching & laying C. I. mains	32.698	32,962	29,750	30.153	31,391	46,482	46,987
Trenching & laying W. I. mains	74	1,368	....	93	512	....	2,254
Valves in C. I. mains	1.746	1,746	1,746	1,860	1,775	1.746	1.911
Valves in W. I. mains	4	36	37	....	26	36	35
Valve boxes on C. I. mains	388	387	388	504	417	435	403
Valve boxes on W. I. mains	3	48	48	....	33	....	50
Hydrants	5,530	5,925	5,715	5,208	5,594	5,925	6,123
Lead pipe in services	....	....	5,174	....	....	5,430	5,854
Wrought iron pipe in services	1,600	8,156	105	1,275	5,056	86	90
Curb & corporation cocks	....	....	2,896	....	....	3,127	3,932
Fittings and stop boxes	....	....	1,127	....	....	1,587	1,671
Trenching and laying for services	....	....	....	....	....	....	9,854
Extra for crossing ry's. and streams	....	....	....	....	....	....	1,026
Meters	....	193	191	....	192	193	169
Boxing on Grand ave. bridge	500	440	383	510	458	500	520
Total	$106,465	$107.383	$109,191	$101,828	$106,455	$133,283	$150,473
Deductions	....	....	*10.433	....	....	....	....
Net total	....	....	$98,761	....	....	....	....

*Services and small mains.

TABLE IX.

DISTRIBUTION SYSTEM.

PRESENT VALUE AND PERCENTAGE CONDITION.

CLASSIFICATION.	CITY.										Per cent condition.	Staff.	Per cent condition.	Company.
	Per cent condition.	Wheeler.	Per cent condition.	Sturtevant.	Per cent condition.	Evans.	Per cent condition.	Fowle.	Per cent condition.	Average city.				
Cast iron mains, including specials	85	$54,346	87.5	$47,915	85	$51,428	85	$55,952	86	$52,403	98	$65.522	98	$67.249
Wrought iron mains	85	72	77	1,049	84	953	80	64	82	535	85	1,128	85	1,142
Trenching and laying C. I. mains	85	27,793	87.5	28,842	85	25,288	85	25,630	86	26,888	98	45,552	98	46.557
Trenching and laying W. I. mains	85	63	77	1,053			80	74	80	396			85	1,916
Valves in C. I. mains	85	1,484	87.5	1,528	85	1,484	85	1,641	86	1,534	98	1,722	98	1,876
Valves in W. I. mains	85	3	77	29	85	31			82	21	85	31	85	30
Valve boxes on C. I. mains	85	329	75	295	63	245	85	433	77	326	85	378	98	396
Valve boxes on W. I. mains		3	75	31	63	30			69	21			98	49
Hydrants	85	5.186	75	4.444	75	4.276	68	3.943	76	4,462	85	5,186	87	5,474
Lead pipe in services					80	4,398					100	5,430	98	5,823
W. I. pipe in services	50	750	75	6,280	80	84	50	638	63	3,794	85	73	85	107
Curb and corporation cocks					85	2.317					100	3.127	98	3,869
Fittings and stop boxes					63	710					87	1,401	85	1,419
Trenching and laying for services													98	9,657
Extra-crossing railways and streams													98	1,005
Meters			70	135	75	143			72	139	82	166	82	163
Boxing on Grand ave. bridge	73	365	70	308	70	268	50	255	66	299	73	365	98	...(*)....
Total		$90,394		$91,909		$91,650		$88,630		$90,816		$130,081		$146,732
Deductions						8,541								
Net total value						$83,199								

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* Included in trenching and laying.

The reproduction values assigned vary from $101,828 by Fowle up to $150,473 by the company. The staff's value is $17,190 lower than the company's and $26,828 higher than the average city value. The differences above noted are found principally in the items cast iron mains, trenching and laying cast iron mains, and services (pipe and trenching and laying).

As regards the present value, the differences between the average city value, the staff's value and the company's value are greater than in the case of the reproduction value. The staff finds a total present value which is $16,651 lower than that given by the company and $39,265 higher than that found by an average of the city values. The differences noted are found largely in the same items noted under reproduction value, and the comparatively large difference between the staff and the city is due largely to the fact that the city's appraisers assign a considerably lower per cent present condition to nearly all of the items included in this group. The wide variation in percentage condition is due to a large extent to the use of the straight line method of depreciation by the city's experts, as opposed to the sinking fund method employed by the staff and the company.

Length of cast iron mains. There is a substantial agreement between all the appraisals as regards the linear feet of mains of the various sizes, with the exception that Mr. Wheeler and Mr. Fowle allow no value for the wrought iron pipe of three inches and below. The following table presents this matter in detail:

TABLE X.

LINEAR FEET OF MAINS AND TRENCHES.

	City				Staff.	Company.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
14-inch cast iron	161	161	161	161	161	161
12 " " "	4.046	4,046	4.046	4,042	4,046	4,046
10 " " "	7.961	7,961	7.961	7,880	7.961	7,809
8 " " "	14,519	14,519	14.519	14.298	14.519	14,519
6 " " "	64.345	64.345	64,345	64.335	64.345	64,345
4 " " "	19,094	19,094	19,094	19.334	19,094	19,094
3 " " "	1,937	2.633	2,633	1,937	2.633	2,633
3 " wrought iron	295	295	295	295	295	295
3 " " "	....	6,612	6.612	....	6,612	6.612
1½ " " "	....	270	270	....	270	270
1¼ " " "	....	210	210	....	210	210

Tonnage of cast iron mains and specials. The total weight or tonnage of the various sizes of cast iron pipe as used by the several appraisers in their calculations are shown in table XI, which follows:

TABLE XI.

TONNAGE OF CAST IRON PIPE.

	City.					Staff.	Company.
	Wheeler.	Sturtevant.	Evans.	Fowle.	City's average.		
14" C. I. pipe.......	8.416	8.44	*8.05	9.6	8.62	8.416	8.42
12" " "	154.760	169.41	106.72	154.6	146.37	169.410	169.41
10" " "	243.607	243.66	218.83	241.1	241.80	259.035	259.05
8" " "	310.997	319.40	304.90	306.3	310.40	351.723	351.72
6" " "	1,082.926	1,093.00	1,081.69	1,082.8	1,080.10	1,092.771	1,092.77
4" " "	214.235	211 31	210.00	216.91	213.11	211.313	211.32
3" " "	16.793	21.75	22.38	16.8	19.43	21.754	21.75
Specials............	50.5	46.5	39.83	57.54	48.6	50.50	50.50
Total.........	2,082.234	2,113.5	*1,992.40	2,085.64	2,068.43	2,164.922	2,164.93

*Does not here include 2 per cent excess weights, amounting to 39,05 tons, grand total 2,031.45.

It is noted that the staff and the company agree as regards the total tonnage of cast iron pipe and specials, and as regards the tonnage for each size of pipe. The city, on the other hand, claims that the actual tonnage is lower than that assigned by the staff, the difference being about 90 tons.

The difference noted is due to the fact that the city has adopted a lower weight per foot for pipe purchased in the earlier years. The city contends that the first seven miles of pipe, laid in 1885 and during the years shortly following, were of a less weight per linear foot of given sizes than those made at the present time. The following table XII was offered by the city to show the different units of weights adopted by the several appraisals:

TABLE XII.

COMPARATIVE TABLE OF WEIGHTS OF CAST IRON PIPE.

	City.				Staff.	Company.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
14", lbs. per lineal foot......	102.5	117	100	117	102.5	102.5
12" " " " "	75	75	75	75	82.1	82.1
10" " " " "	60	60	60	60	63.8	63.8
8" " " " "	42	42	42	42	47.5	47.5
6" " " " "	33	33	33	33	33.3	33.3
4" " " " "	22	22	22	22	21.7	21.7
3" " " " "	17	16.2	17	17	16.2	16.2

It appears that the staff used what is known as the class B standard in determining upon the weights to be used for the pipe in Beloit. It further appears that this standard conforms to proper engineering practice in laying out water works systems which must be adequate to meet the fire pressure demand in Beloit. No pipe has been weighed in connection with the investigation in this proceeding and no records are available which show the actual weights of the different sizes laid in Beloit. In the absence of direct proof to the contrary, we are inclined to accept the figures of the staff as regards the weights to be used in this case.

Prices of cast iron pipe and specials. The difference in the reproduction value of the cast iron mains and specials is due, to a certain extent, to the use of different prices or cost per ton of the various sizes of pipe and specials. The question of unit prices has been discussed by the Commission in several earlier decisions, and it would seem sufficient at this point to call attention to those earlier opinions in which the methods followed by the staff are clearly outlined and the question of the use of average prices and current prices is discussed in detail. See *City of Appleton v. Appleton Water Works Co.* 5 W. R. C. R. 215, 228—235. In this decision the prices used on cast iron pipe are discussed specifically. See also *Hill et al. v. Antigo Water Co.* 3 W. R. C. R. 623, 679—682.

Trenching and laying. Table XIII, following, gives a comparison of the figures for the cost per linear foot of the trenching and laying:

TABLE XIII.

COMPARATIVE TABLE OF COST OF TRENCHING AND LAYING MAINS.

	City.					Staff.	Company.
	Wheeler.	Sturtevant.	Evans.	Fowle.	City average.		
14-inch cast iron main, per ft.	$0.470	$0.460	$0.425	$0.420	$0.444	$0.580	$0.603
12 " " " " " "	.420	.410	.382	.380	.398	.535	.547
10 " " " " " "	.370	.360	.334	.340	.351	.485	.498
8 " " " " " "	.330	.325	.290	.300	.311	.435	.437
6 " " " " " "	.280	.270	.255	.260	.266	.405	.405
4 " " " " " "	.250	.245	.220	.230	.236	.370	.370
3 " " " " " "	.230	.225	.212	.210	.219	.350	.350
3 " wrt. " " " "	.250	.200	....	....	.225	....	.315
2 " " " " " "	....	.185	....	....	.185	....	.305
1½ " " " " " "	....	.180	....	....	.180	....	.300
1¼ " " " " " "	....	.175	....	....	.175	....	.300

The testimony introduced by both city and company in connection with the cost of trenching and laying is summarized in the foregoing table. Considerable emphasis was placed by the city on the reliability of the testimony of its experts in regard to the cost of trenching and laying. On the other hand, the company produced records covering the actual cost of trenching and laying during the past few years and pointed to the fact that these unit costs were uniformly higher than the prices adopted by either the staff or the company in their valuations. The soil conditions in Beloit, the danger of caving, the practicability of the use of tunnels, the width of trenches, the depth of trenches and the wages of laborers, etc., were all matters carefully reviewed in the examinations of the witnesses and in their reports. It seems both unnecessary and impracticable to review herein all the evidence offered in connection with this question of trenching and laying. A careful study of the facts brought out at the hearings and by subsequent investigation has convinced us that the figure fixed by the staff in this item is perhaps as fair and equitable, all things considered, as any. We have, therefore, allowed the staff's values for trenching and laying to stand.

Valves, valve boxes, hydrants. There appears to be but a slight difference between the several reproduction values as regards these items.

Reference to table VIII will show that the staff assigns an aggregate value to these items which is about midway between the average of the city values and the company's value.

Services. This includes all the items such as lead pipe in services, wrought iron pipe in services, curb and corporation cocks, fittings and stop boxes, trenching and laying services.

The city contends that no allowance whatever should be made for services, except the first 100 installed, which the evidence shows were put in by the company free of cost to the consumers. The company, on the other hand, claims full allowance for all services.

The tentative valuation details the items under consideration as follows:

COST OF REPRODUCTION.

Lead pipe in services	**$5,430**
Wrought iron pipe in services	**86**
Curb and corporation cocks	**3,127**
Fittings and stop boxes	**1,587**
Total	**$10,230**

The company claims a value of $11,547 and also claims $9,854 for trenching and laying for services, which item does not appear in the staff's valuation. The original computations and summary sheets submitted by the staff show the inclusion of 31,284 linear feet of trenching and laying small pipe in services, cost new $9,542, and present value $8,111, which are omitted in the summary. The company claims that the staff has omitted 1,283 feet in the length of services, but investigation shows that such omission was not made and that the total of 31,284 feet covers all services laid of date Jan. 1, 1909.

It appears that, with the exception of the first 100 services laid, all services have been installed by the company and the consumer charged for the same at an average price of $15 each for ⅝ inch, and $20 each for ¾ inch and 1 inch services.

It is the contention of the city that, as far as equity and justice is concerned, the cost of the services mentioned should be excluded from a valuation upon which rates are to be based. The city asserts that the company has compelled each private consumer to not only pay the cost of the service, but even more than this cost, and that these services have cost the company nothing, and that the company has even profited by their installation charge. The city asks: Should the consumer be made to furnish the money with which to make the private connection with his house and then perpetually be made to pay the company an additional sum as profits, depreciation, etc., on his own investment? The city contends that every reason for excluding the value of paving which has not been disturbed by the company applies with equal force for the exclusion of the value of these services which represent no investment made by the company.

The city further asserts that it cannot be claimed that the company has title to these services; that they are not a part of the general distribution system of the company; that should any one of them be shut off or taken up, it would not affect any part of the circulating system of any other consumer; that they are intended to be and are for the sole use and benefit of the properties in which they are located.

The city further argues that the service is on the consumers, or property owners' land, not only that part from the curb to the house, or the lot line to the house, but all of it from the place where it connects with the main to where it connects with the house piping, for in Wisconsin the abutting owner owns the land of the street to its center, and the fee is his as much as that which abuts on the street, and it is subject to all and every use by him that he desires to make which is not inconsistent with the public's easement over it for street purposes only.

Concerning the first 100 services which were paid for by the company, as an advertising or new business venture, the city claims that it is doubtful if allowance should be made for even those any more than it is made for similar expenditure by gas companies in putting in services at the company's expense on private property for similar reasons; and the fact that these 100 are on private property, and for private individual use, is not altered by payment for them by the company.

To all of these contentions on the part of the city the company disagrees and quotes from numerous decisions of the courts to support its counter claim that the company is in law entitled to a return upon the property which it devotes to the public use, quite irrespective of whether the property was acquired by purchase, gift or otherwise. The company asserts that to reject such items from the valuation for purposes of rate making would operate to deny the company a return upon a part of its property, or, in other words, to deny to it the use of a part of its property, which amounts to the unconstitutional taking of a part of its property without compensation.

The Commission has expressed its attitude in regard to this question of service connections paid for by consumers in the decision *Hill et al. v. Antigo Water Co.* 3 W. R. C. R., 623, 693:

> "The petitioners contended that the service connections, the cost of which had been met by the consumers, should not be included in the value of the plant. This contention would also seem to be well taken, for it would hardly be fair to make the consumers pay interest and perhaps other costs on property for which they had met all the charges."

It appears to be clearly established that the charges assessed against the consumers by the company for the installation of services has been in the aggregate sufficient to cover the cost of this work to the company. In view of these facts we are of the opinion that the value represented in the services under consideration, and for which the consumers have paid, is not a fair element in the valuation for the purposes of this case. This applies also to the value of the so-called private mains,to the amount which the consumers have paid and have not been reimbursed by the company.

As regards the first 100 services which were installed by the company without expense to the consumer, the following quotation is applicable:

> "Expenditures for the development of the business, when reasonable and when well placed, would, therefore, seem to be legitimate and to constitute a charge that, in some form, should be borne by the customers, or by those who avail themselves of the service in question. Whether these expenditures should be charged to construction and thereby become a permanent charge on the consumers, or be charged to the operating expenses and thereby be wiped out about as incurred, are questions that cannot be settled independently of the surrounding conditions. When the rates and the earnings of the utility are such as to yield a reasonable return to the investors if the expenditures in question are included in the operating expenses, then 'operating expense' also appears to be the place to which they should be charged. When, on the other hand, the rates and the earnings are not high enough to permit these expenditures to be charged to operating expenses without resulting in less than reasonable returns on the investment, then it would seem that until the earnings become adequate, at least, they should be charged to the cost of the plant." *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 589.

With the facts available in regard to the early history of the water plant and during the period when the services considered were installed, and in line with the rule laid down in the decision just quoted, we are inclined to believe that the cost of the services in question is a proper capital charge and is, therefore, considered a proper item to be included in the valuation. The total cost of these services, as closely as the information at hand enables us to determine, appears to be about $1,500.

Extra allowance for mains under railway crossings and streams. An extra allowance to the amount of $1,026 cost new, and $1,005 present value, is claimed by the company as representing the extra expense and cost incurred by the company in installing its mains under the railroad crossings and streams. The company believes that this extra cost was overlooked by the staff and thus inadvertently omitted from the tentative valuation. In fact it appears that these items were given careful consideration and no extra allowance was made by the staff because of the conviction that the unit prices used in the calculation of the value of trenching and laying, etc., were sufficiently high to cover these items where some additional expense of this nature may have been incurred.

Meters. The total number of water meters in service represent a total investment of about $193 cost new. The city objects to the inclusion of this item because of the private ownership of these meters. It is not entirely clear whether all of the water meters have been paid for by private consumers or whether they represent, in part at least, an investment made by the company.

Present values. Objection was made by the city that the present value of the distribution system was placed too high by the staff. Especial emphasis was placed on the matter of crenothrix as affecting the life of the mains and on the matter of the adequacy of the system, also the method of depreciating the mains, etc., entered largely into the determination of present value. These are elements which will be given detailed consideration later, in discussing the general features pertaining to the valution of the water department.

Power Plant Equipment.

The reproduction values and present values of the several items contained in this group are given in tables XIV and XV, respectively:

TABLE XIV.

POWER PLANT EQUIPMENT.

REPRODUCTION VALUES.

	City.				Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
East side steam water works	$9,495	$9,774	$8,863	$8,300	$9,495	$10.892
Red mill	1.903	2,084	1,769	1,908	1,903	1,955
Stone mill	5.359	5.100	4.589	4,380	5,359	6,165
Electric pumping station	3,337	3,537	2,584	3,235	3,337	3,470
Total above items	$20,094	$20,495	$ 7,805	$17,823	$20,094	$22,482
Electric station, mechanical	....	....	....	....	6,766	....
Total	$20,094	$20,495	$17,805	$17,823	$26,860	$22,482

TABLE XV.

POWER PLANT EQUIPMENT.

PRESENT VALUES.

	City.				Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
East side steam water works	$5,806	$5,210	$4,396	$3,923	$5,806	$6,845
Red mill	1,626	1,196	1,460	1,396	1,626	1.551
Stone mill	4,350	3,218	3,308	3,305	4,350	5,120
Electric pumping station	3,323	3,399	2,570	3,140	3,323	3,470
Total of above items	$15,105	$13,023	$11,734	$11,764	$15,105	$16,986
Electric station, mechanical	....	....	....	....	5,250	....
Total	$15,105	$13,023	$11,734	$11,764	$20,355	$16,986

It will be noted that the staff has included in the power plant equipment a cost of reproduction of $6,766 and present value of $5,250 for electric station which neither the city or the company have included in this group. This difference is due to the fact that the staff apportioned to the water department 15 per cent of the value of the electric station because the water department consumed considerable current which was generated at the electric station. Since it is the practice of the respondent company to measure the current thus supplied to the pumping station and assess against the water department a regular rate for the power, and since the electric current used by the water department may be accurately determined as to quantity and cost, it is believed that no apportionment of the electric station to the water department should be made. Further, it is apparent that the amount of electric current used by the water department may vary considerably in different months and years, and for this reason, if for no other, it does not appear reasonable to charge a certain arbitrary percentage of the investment in the electric station to the water department.

The reproduction values of the total power plant equipment as assigned by the city's experts, and by the staff and the company, are quite closely agreed. The difference between the staff and the company as regards the reproduction value of this group is due principally to the higher values assigned by the company to certain details, such as the machine foundations, turbine harness and line shaft.

The city's present values, due primarily to the use of the straight line depreciation theory, are lower than those of the staff. The city also contends that there are certain items in this group which should be excluded from the valuation, on the grounds that these items are non-operative. The non-operative property will be discussed later.

Buildings and Miscellaneous Structures.

The following tables XVI and XVII show the various values, both reproduction and present, assigned to the items in this group:

TABLE XVI.

BUILDINGS AND MISCELLANEOUS STRUCTURES.

REPRODUCTION VALUES.

	City.				Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
East side steam station	$4,074	$4,260	$4,000	$6,476	$3,999	$4,107
Stack for same	1,047	1,222	930		1,179	1,203
Coal shed at same	498	411	400		411	493
Dwelling of engineer at same	759	725	675		675	800
Sidewalks, fences, etc., at same	244	332	332		332	3 2
Stone mill	6,490	7,156	4,250	6,758	7,156	12,019
Red mill	2,746	2,363	2,233	2,233	2,363	3,068
Electric pumping station	1,789	1,860	1,646	1,646	1,860	2,251
Total of above items	$17,647	$18,329	$14,466	$17,113	$17,975	$24,873
Electric dept. (15 per cent)	....	....	....	....	5,359	....
Total	$17,647	$18,329	$14,466	$17,113	$23,334	$24,873

TABLE XVII.

BUILDINGS AND MISCELLANEOUS STRUCTURES.

PRESENT VALUES.

	City.				Staff's tentative valuation.	Company valuation.
	Wheeler.	Sturtevant.	Evans.	Fowle.		
East side steam station......	$2,852	$2,840	$2,720	$3,886	$3,039	$3,286
Stack for same...............	733	815	632		896	914
Coal shed at same........	398	349	340		378	444
Dwelling of engineer at same	532	513	513		513	560
Sidewalks, fences, etc., at same........................	232	260	299		299	315
Stone mill....................	5,066	4,771	2,890	3,379	6,083	10,629
Red mill.......................	1,098	1,418	1,340	893	1,772	2,840
Electric pumping station....	1,520	1,552	1,448	1,235	1,637	2,026
Total of above items.....	$12,431	$12,518	$10,182	$9,393	$14,617	$21,014
Electric dept. (15 per cent)..	....	....	....	....	3,334	....
Total.......................	$12,431	$12,518	$10,182	$9,393	$17,951	$21,014

In this group, as in the group covering power plant equipment, the staff has apportioned 15 per cent of the electric department, because of the fact that a considerable amount of electric current is consumed by the water department. For the same reasons as set forth in the discussion of power plant equipment values, the 15 per cent should not be charged to the water department values in this group.

As regards the reproduction value of buildings and miscellaneous structures, there is little difference between the city and staff values. The company, however, claims a reproduction value of $24,873, as against the staff's $17,975, or a difference of $6,898. The largest part of this excess is found in the item stone mill. It appears that the company gives the west side stone station a reproduction value of $6,057, and the flume $4,687, whereas the staff gives a reproduction value of $7,156 to the station. It is contended by the company that the staff has either omitted the flume or has placed too low a value upon the flume and station. This same claim is made by the company in regard to the red mill, which the staff has valued at $2,363 while the company gives the red mill a value of $1,529 and the flume at that mill a value of $1,490. It is also the contention of the company that the staff has omitted the tail race excavations at the west side station and the red mill, upon which the company places reproduction values of $1,275 and $649, respectively. Considerable testimony was introduced by the company with regard to these items. It appears that while the staff did not omit the items described from their calculations, a fair value of the items may be somewhat greater than that allowed by the staff; it also seems clear that the values claimed by the company on these items may be higher than the facts at hand will support.

In this group, as in previous groups thus far discussed, the city has allowed a lower percentage condition for the several structures than given by the staff and the company. Very little testimony was offered by either city or company in regard to this point, the percentage conditions arrived at by the several appraisers being the results of judgment based upon more or less thorough examination of the structures in question. We see no valid reason why the staff's figures may not be adhered to.

Office Furniture and Appliances.—Tools, Implements and Machinery.—Horses, Wagons and Miscellaneous.

Reference to table II will show that there is but little difference between the several valuations as regards these groups. The city offered no testimony in regard to these groups and relied upon the staff's figures. The company points out that one or two items were omitted by the staff, but these omissions, if made, will have no effect on the results.

GAS DEPARTMENT

Land

This item is discussed later as an item common to all three departments.

The following table summarizes the several valuations of the gas department, exclusive of land:

TABLE XVIII.
GAS DEPARTMENT.
SUMMARY OF REPRODUCTION VALUES.

CLASSIFICATION.	CITY.		Staff.	Company.
	Evans.	Fowle.		
Holders	$36.273	$34.873	$42.223	$46.257
Distribution system	76,047	82,645	103.061	111.789
Power plant equipment	44.871	49.787	57.590	61.263
Buildings and miscellaneous structures	25,409	29,192	31.651	39,115
Office furniture and appliances	979	979	979	980
Tools and instruments	1.453	1.593	1.627	2.192
Horses, wagons and miscellaneous	843	843	843	661
Fuel runs	....	....	....	1,674
Stores and supplies	15,924	16,219	13.347	16.469
Paving	....	....	10,344	9,482
Total	$201.799	$216,131	$261,665	$289,882

It will be noted from the foregoing summary of values that the staff's value lies between those of the city and company. The principal points of difference between the several valuations occur in the first four items.

Holders.

The reproduction value, present condition per cent and present value as given in the several appraisals are shown in table XIX which follows:

TABLE XIX.
COMPARISON OF HOLDER VALUES.

CLASSIFICATION.	CITY.		Staff.	Company.
	Evans.	Fowle.		
REPRODUCTION VALUES.				
Tank of 56,000 cu. ft. holder	$3,100	$4,000	$5,600	$9,245
Metal work of same	4,000	4,200	4,200	4,200
Foundation of 300,000 cu ft. holder	2,250	2,550	2,800	2,650
Metal work of same	26,800	24,000	29,500	30,000
Water in tank of same	123	123	123	162
Total reproduction value	$36,273	$34,873	$42,223	$46,257
PRESENT CONDITIONS—PER CENT.				
Tank of 53,000 cu. ft. holder	80	70	83	85
Metal work of same	80	70	83	85
Foundation of 300,000 cu. ft. holder	100	98	100	100
Metal work of same	100	98	100	100
PRESENT VALUES.				
Tank of 56,000 cu. ft. holder	$2,480	$2,800	$4,648	$7,866
Metal work of same	3,200	2,940	3,524	3,623
Foundation of 300,000 cu. ft. holder	2,250	2,499	2,800	2,650
Metal work of same	26,800	23,520	29,500	30,000
Water in tank of same	123	121	123	162
Total present value	$34,853	$31,880	$40,595	$44,301

The company valuation of this group exceeds that of the staff by $4,034, cost new and $3,706, present value. The principal item of difference is the 56,000 cubic foot holder. For the company Mr. Evans places the present value of the group $5,472 lower than the staff and Mr. Fowle $8,715 lower than the staff. The testimony of Mr. Forstall was introduced by the company to substantiate the reasonableness of the company's figures.

The difference between the staff and the city as regards present value, while due to some extent to the use of different methods of depreciation, are primarily due to the comparatively large difference in reproduction value.

After consideration of the various valuations offered and the various elements which would affect the value of items such as included in this group, we believe that the figures of the staff are reasonable and may safely be adhered to.

Distribution System.

Much of what was said in regard to the water distribution system applies also to the valuation of the gas distribution system. The differences as regards the prices used by the several appraisers are of the same character. The basis of unit prices adopted by the staff have been fully explained in other decisions, references to these opinions being given under the water distribution system. No repetition of these discussions appears necessary at this point. What was written in regard to the weights of the various sizes of pipes under the water distribution system, applies with equal force to the same question under the gas distribution system.

The lower present value of the mains, etc., as submitted by the city's experts, is again due to a difference in depreciation methods and will be taken up later.

Services. The city contends that the cost of the services is not a proper item of allowance in the valuation, for the reason that they are all located on the private real estate of the consumers and are, therefore, the property of the consumers. The city asserts that this is true at least of that portion of them which is within the lot line, or between the curb and the house.

It appears that it is the practice of the company to install the gas service from main to house or meter, and the company contends that they are all properly included in the valuation because they are placed there at the request of the consumer and at the expense of the company.

There appears no direct proof that the company has not installed all of the services so described at its own expense and has passed any of this cost on to the consumers. It would seem clear that the same reasons given under the water distribution system for excluding the value of the services there paid for by the consumers, will make it only reasonable and just to allow the company the full value of the services paid for by the company and included in the group under consideration.

TABLE XX.

GAS DISTRIBUTION SYSTEM.

CLASSIFICATION.	City.						Staff.		Company.	
		Evans.		Fowle.		Average.				
REPRODUCTION VALUES.										
Cast iron mains including specials		$25,102		$25,103		$25,102		$26,093		$26,787
Wrought iron mains including specials		5,395		5,381		5,386		6,531		7,289
Trenching and laying cast iron mains		10,243		10,764		10,503		17,587		18,829
Trenching and laying wrought iron mains		5,002		7,690		6,346		9,217		9,865
Services		3,952		4,000		3,976		4,493		4,718
Trenching and laying services		8,509		8,786		8,648		14,003		16,553
Valves, valve boxes, drips and crossings		1,463		1,755		1,609		2,268		[1]2,959
Service fit. and specials		863		1,818		1,340		1,473		3,288
Governors		4,354		4,353		4,354		4,837		4,930
House portion of serv.		4,574		5,858		5,216		6,451		[2]5,583
Meters		9,265		9,331		9,298		10,108		16,580
Total		$78,722		$84,839		$81,780		$103,061		$118,375
PRESENT CONDITION AND PRESENT VALUES.										
Cast iron mains	80%	$20,082	80%	$21,695	80%	$20,889	92%	$24,588	92%	$25,227
Wrought iron mains	88	4,748	90	4,843	89	4,795	97	6,335	97	7,070
Trench. and laying cast iron mains	80	8,194	80	8,611	80	8,403	92	16,180	92	17,323
Trench. and laying w. i. mains	88	4,402	90	6,921	89	5,661	97	8,940	97	9,569
Services	80	3,162	80	3,200	80	3,181	92	4,134	92	4,341
Trench. and laying serv.	80	6,807	80	7,029	80	6,918	92	12,883	92	15,229
Valves, valve boxes, drips and crossings	90	1,341	95	1,529	92	1,435	97	2,196	97	2,866
Serv. fit. and specials	80	690	80	1,454	80	1,072	92	1,355	92	3,032
Governors	90	3,919	95	4,135	92	4,027	92	4,450	95	4,688
House portion of services	80	3,659	87	5,096	84	4,378	92	5,935	....	[2]6,059
Meters	67	6,208	67	6,252	67	6,230	90	9,805	83	13,761
Total	....	$63,212	....	$70,765	....	$66,989	....	$96,801	....	$109,165

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[1] Includes extra for crossing streams and tracks.
[2] Omitted from statement by company.

TABLE XXI.

GAS DEPARTMENT, DISTRIBUTION SYSTEM.

PRICE OF CAST IRON PIPE.

CLASSIFICATION.	City.			Staff.	Company.
	Evans.	Fowle.	Average.		
8 in. main per ton	$29 80	$29 31	$29 55	$30 48	$30 90
6 " " " "	29 80	29 31	29 55	30 49	31 01
4 " " " "	30 80	30 31	30 55	31 47	31 99
3 " " " "	30 80	30 31	30 55	31 47	31 99
Specials " "	50 00	60 00	55 00	60 00	60 00
Cartage " "	50	....(1)...	50	50	75

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[1] 50 cts. per ton included in unit price.

TABLE XXII.

GAS DEPARTMENT, DISTRIBUTION SYSTEM.

PRICE OF WROUGHT IRON PIPE.

CLASSIFICATION.	CITY.			Staff.	Company.
	Evans.	Fowle.	Average.		
8 in. W. I. pipe, per foot	$0.85	$0.846	$0.848	$0.846	$0.85
3 " " " " "	.19	.189	.1895	.204	.204
2 " " " " "	.09	.090	.090	.108	.123
2 in. Merchants' pipe, per foot	....	....	....	.972	.973
1½ " " " " "	.068	.068	.068	.0729	.0729
1¼ " " " " "	.0566	.056	.056	.0608	.0608
1 " " " " "	.0415	.041	.041	.0446	.0416
Specials and fittings, per ton	....	159.00	....	90.00	....
Freight and cartage	1.50	1.50	1.50	1.50	1.75

TABLE XXIII.

GAS DEPARTMENT, DISTRIBUTION SYSTEM.

CLASSIFICATION.	CITY.				Staff.	Company.
	Sturtevant.	Evans.	Fowler	Average.		
COST OF TRENCHING AND LAYING MAINS.						
8" cast iron pipe, per foot	$0.245	$0.192	$0.20	$0.212	$0.355	$0.374
6" " " " "	.220	.169	.17	.186	.285	.317
4" " " " "	.200	.137	.15	.162	.240	.256
3" " " " "	.175	.1325	.14	.149	.220	.223
8" wrought iron pipe, per foot	....	....	....	....	.250	....
3" " " " " "	.140	.1056	.115	.120	.175	.188
2" " " " " "	.125	.0900	.100	.105	.165	.175
1½" " " " " "	.115	.0875	.095	.099	.165	.170
1¼" " " " " "	.115	.0845	.090	.0965	.160	.170
1" " " " " "	....	.0820	.090	.086	.160	.170
TRENCHING AND LAYING SERVICES.						
2" wrought iron pipe, per foot	....	$0.086	$0.090	$0.088	$0.145	$0.16
1½" " " " " "	....	.084	.090	.087	.140	.16
1¼" " " " " "	....	.082	.085	.084	.140	.16
1" " " " " "	....	.080	.085	.082	.135	.16
¾" " " " " "	....	.080	.085	.082	.135	.16

TABLE XXIV.

GAS DEPARTMENT, DISTRIBUTION SYSTEM.

LINEAR FEET OF MAINS AND TRENCHES.

CLASSIFICATION.	CITY.			Staff.	Company.
	Evans.	Fowle.	Average.		
8 in. cast iron	1,683	1,683	1,683	1,749	1,749
6 in. " "	16,314	16,314	16,314	16,344	16,344
4 in. " "	40,481	40,481	40,481	40,751	40,751
3 in. " "	11,297	11,297	11,297	11,489	11,489
8 in. wrought iron	310	310	310	310	310
3 in. " "	737	737	737	737	737
2 in. " "	48,756	48,756	48,756	45,592	46,107
2 in. merchants iron	....	....	....	3,305	3,305
1½ in. " "	2,978	2,978	2,978	2,822	2,822
1¼ in. " "	803	803	803	976	976
1 in. " "	1,997	1,997	1,997	1,997	1,997

Power Plant Equipment.

The power plant equipment in the gas department is grouped under two general heads, namely: the old gas plant, and the new gas plant. The values of the old gas plant are as follows:

	Reproduction.	Present value.
Evans	$17,156	$10,170
Fowle	18,715	12,262
Staff	19,379	15,565
Company	20,516	16,756

The staff has also included under this group one per cent of the value of the electric station, but for reasons stated in another part of this discussion this one per cent will be considered as a part of the electric station valuation.

The differences apparent in the foregoing tabulation are due to differences on many scattered items and cannot be attributed in large measure to any particular items. A comparison of the several detailed appraisals reveals a substantially uniform variation as regards the details contained in this group. It does not appear from this analysis and comparison that the departures from the staff's figures as regards the separate items, if such departures are justified, will in any appreciable measure affect the total valuation of the group as shown by the tentative valuation.

The values assigned to the new gas plant by the several appraisals are as follows:

	Reproduction.	Present value.
Evans	$27,715	$25,327
Fowle	31,072	29,483
Staff	37,475	36,940
Company	40,753	40,275

The remarks above made as regards the differences in the values assigned to the old gas plant are equally applicable in connection with the new gas plant.

The total values assigned to the entire group, including both the old gas plant and the new gas plant, are shown in the following comparative statement:

	Reproduction.	Present value.
Evans	$44,871	$35,497
Fowle	49,787	41,745
Staff	56,854	52,505
Company	61,269	57,031

The staff values above given do not include $736 cost of reproduction and $631 present value, representing one per cent of the electric station which the tentative valuation apportions to the gas department power plant equipment.

Buildings and Miscellaneous Structures.

The items of this group are detailed as follows in the tentative valuation:

CLASSIFICATION.	Reproduction.	Present value.
1. New gas plant	$19,028	$18,838
2. Old gas plant	7,600	5,320
3. Oil shed	22	22
4. Sidewalks, fences, stone walls, etc	778	607
5. Stack of old gas plant	84	59
6. Coal shed and oil house, old station	2,181	1,090
7. Warehouse, old station	702	597
8. Old electric station	191	67
9. Stack of old station	11	4
10. New electric station	142	139
11. Stack of new station	14	13
12. Stack of new gas plant	599	539
13. Barn, stores, houses on old dwelling lot	300	120
Total	$31,652	$27,415

Items 8, 9, 10 and 11 are items which are parts of the electric department which the staff has considered as in part chargeable to the gas department and the figures above given represent one per cent of their total value. The total of these items thus charged to the gas department is $358 reproduction value, and $223 present value. These items will be deducted and added to the electric department for reasons given elsewhere in this discussion.

The total reproduction and present values assigned to this group by the several appraisals is shown below:

	Reproduction.	Present value.
Evans	$25,409	$20.416
Fowle	29,192	24,219
Staff	31,652	27.415
Company	39,115	32,509

The company's valuation includes $4,228 cost new and $1,786 present value, of buildings which the staff has listed under unoperated property and which will be discussed under that head later.

These corrections applied to the above statement of values considerably reduces the difference between the staff and company values and places the staff valuation about midway between the average city values and the company values.

Tools, Implements and Machinery.—Office Furniture and Appliances.—Horses, Wagons and Miscellaneous.—Stores and Supplies.—Paving.

Exclusive of paving, the differences between the company, the staff and the city as regards the aggregate values of the above items are comparatively slight. Both the city and the company place a larger value on stores and supplies than is assigned to this group by the staff. Some omissions by the staff are mentioned by the company, but investigation does not bear out this contention.

The company claims a cost of reproduction of fuel runs of $1,674, and present value of $1,640. This item is not included in the staff or city inventories. These runs consist of the piping connections from the meter to the stove. It appears that these were paid for by the company. It is contended by the company that this item, if not treated as a part of the physical property of the plant in the valuation, should be regarded as a part of the cost of business development. This item would seem to be subject to the same treatment as that of the so-called free services, and its inclusion either as an item of the cost of physical property or of the cost of development of the business, or whether it be treated as an operating expense, depends upon the analysis of the financial conditions under which the utility has been operating.

The question of the inclusion of the item of paving has been treated elsewhere in this discussion.

ELECTRIC DEPARTMENT.

Table XXV, following, presents a comparative statement of the reproduction values assigned to the several groups included in the electric department:

TABLE XXV.

COMPARISON OF REPRODUCTION VALUES.

	City.		Staff.	Company.
	Evans.	Fowle.		
Distribution system	$68,221	$69,209	$74,810	$76,192
Power plant equipment	72,993	73,096	77,181	79,662
Bldgs. and misc. structures	28,583	32,979	35,955	40,577
Office furniture and appliances	979	979	979	888
Tools and implements	1,464	1,464	1,464	1,937
Horses, wagons and misc	141	141	141	276
Stores and supplies	10,636	9,386	10,636	22,406
Total	$183,017	$187,254	$201,166	$221,938

In the foregoing table the amounts which the staff had apportioned to the other departments, and which method is discussed elsewhere, have here been charged entirely to the electric department. The total reproduction values shown in the table show the staff figures to be about midway between the city and the company appraisals. The same is true as regards present value which the company places at $186,075, Fowle at $146,908, and Evans at $142,008. The larger differences as regards present value are here, as in the other departments, due largely to the use of the straight line method of depreciation by the city's appraisers.

As regards the distribution system, it appears that Mr. Fowle excluded $572, reproduction value, for the so-called Morgan line, on the ground that this line was not paid for by the company but by a private consumer. This is not clearly established.

It seems unnecessary to go into a discussion of the various items upon which differences occur as between the several valuations. It seems clear from a careful study of the various groups and items listed above that there is not sufficient ground upon which to justify any change in the total values appearing in the staff's valuation. Here, as noted elsewhere, the company has called attention to several omissions which the company claims the staff has made. Investigation covering the original notes and computations made by the staff do not bear out this contention on the part of the company.

LAND.

It appears that the company and the city have agreed to accept the staff's valuation on the land owned and held by the respondent. The actual apportionment of this value as between the several departments and as between operated and unoperated property is contested, however. It further appears that the city rests its acceptance of the land values given by the staff upon the apportionment made by the staff as between operated and unoperated property. The city appears to have been of the belief that while some of the values given to certain parcels of land by the staff were excessive, that the percentage of these parcels allowed by the staff as operative minimized the effect of the total allowance so that the city did not consider the difference of sufficient amount to warrant a contest.

In a total value of land of $46,090 the staff includes $32,089 under operated property and sets aside $14,001 as unoperated property. Of the total operated property ($32,089) the staff assigns $14,822 to the water department, $10,239 to the gas department, and $7,028 to the electric department. The city finds that $11,254 represents the value of the land used by the water department, and that the amounts charged to the gas and electric departments are ample. The company, on the other hand, claims that all of the land should be considered operated property and distributes the total land value as follows: water $21,081, gas $23,140, and electric $1,869. The following table XXVI summarizes the distribution of land values as claimed by the company and city and as submitted by the staff:

TABLE XXVI.

APPORTIONMENT OF LAND VALUES.

	Water.	Gas.	Electric.	Total.
City	$11,254	$10,239	$7,028	$28,521
Staff	14,822	10,239	7,028	32,089
Company	21,081	23,140	1,869	46,090

The manner in which the staff has apportioned the land values among the several departments is shown in the following table. This table also describes the several parcels of land as regards their location.

APPORTIONMENT OF LAND VALUES.

BY THE STAFF.

	WATER.		GAS.		ELECTRIC.		UNOPERATED.	
	Amt.	P. ct.	Amt.	P. ct.	Amt.	P. ct.	Amt.	P. ct.
East side water works station.....	$8,350	100	......	......	......	......	......	......
West side " " "	2,500	20	......	......	......	......	$10,000	80
Old gas plant	......	......	3,975	75	......	......	1,325	25
New gas plant.....................	3,568	20	6,244	35	$5,352	30	2,676	15
Electric plant.....................	404	19.238	20	.952	1,676	79.8	......	......

It will be noted that the staff has charged 20 per cent of the land at the new gas plant to the water department. This was done because of the fact that the company uses a portion of this parcel as a storage ground for water pipe. The city contended and introduced testimony to show that it was unnecessary for the company to use this parcel for storing water pipe, that land was available elsewhere for this purpose, and that for these reasons the 20 per cent should be apportioned to unoperated property.

The company suggests that it would be simpler, and more in accord with correct practice, to eliminate this 20 per cent from the water department, and give the entire valuation to the gas department, charging the water department and crediting the gas department for storage rental. In case of sales, company suggests, it would be impracticable to exclude the part used by the water department as a pipe yard. As regards the contention of the city that no extra land is required by the water department as a pipe yard, the company called attention to the fact that there are no side track facilities at the east side station, and that the west side station is not so located as to be adapted for a pipe yard.

It was suggested by the city that land for storing pipe might be rented from outside parties. To this the company replied that no advantage would accrue to either the company or its consumers as a result of such a policy.

We are inclined to believe, from the testimony and facts presented and subsequent investigation, that this parcel of land is both used and useful to the company and for this reason should be included in the valuation. It further appears that this parcel should be charged entirely to the gas department and a reasonable rental therefor be charged the water department, based on the actual use of the property by the water department.

Some difference of opinion appears as between the staff and the company in the matter of the apportionment of the land located at the electric station on the east side of the river. This difference involves such a small sum, however, as not to be worthy of more detailed analysis. The staff's apportionment, while it may be open to some criticism, will, because of the very small amount involved, be allowed to stand.

It will be noted that the staff includes in its valuation but 20 per cent of the $12,500 valuation placed upon the land at the west side pumping station, the remaining 80 per cent, amounting to $10,000, being treated as unoperated property. The company contends that this $10,000 should be added to the land valuation of the water department and advances the following reasons:

The company contends that while all of this land is not now being used in connection with the operation of the west side station, it was all acquired by the present company when it took hold of the business, and is included within the bond issue, upon which the company is paying interest. An inspection of the property, the company states, will disclose that the stone mill and the red mill, constituting the west side station, are located upon the higher portion of the property, and upon that portion thereof which abuts on the alley. The 80 per cent of the parcel rejected from the valuation as unoperated, is the back-lying portion nearer the river. The company contends that it is not at all practicable to divide the parcel by cutting off the front which abuts upon the alley from the rear portion which fronts upon the river. The company further contends that to deny it a return upon a large percentage of this parcel, in substance means that it must hold a part of it as dead property, although the taking of the rejected part was a necessary incident of the acquisition of the other, and although its retention is a necessary incident of the use of the operated part. Whether the future will demand additional supply at the west side, of course, cannot now be known. If so, the parcel in question will obviously require utilization for well space and reservoir capacity.

The city asserts, on the other hand, that the larger portion of this parcel is marshy and low, is frequently flooded, and is practically useless in its present condition; that the two buildings which are located upon this parcel are small and old and that no land is needed, except a little in excess of that on which they stand. The city, moreover, advocates the consolidation of all water stations at the east side pumping station, and that the parcel in question should be entirely excluded from the valuation.

While a strict interpretation of the rule "used and useful" as applied to the parcel in question, might appear to work an injustice to the company in general, it does appear that under present conditions the unoperated portion would hardly constitute a fair and just element in the valuation for rate-making purposes and constitute a permanent charge against the consumers. This conclusion would appear to be equally true when we consider the probable future usefulness of this unoperated portion.

The land at the new gas plant has been divided between all three departments by the staff, and 15 per cent of the total has been charged to unoperated property. The company objects to the exclusion of this 15 per cent, basing its objections on the same arguments as advanced in the case of the west side water station property. The company further contends that the 30 per cent assigned to the electric department by the staff, on the ground that this amount is used for the storage of poles, should be assigned to the gas department and a reasonable rental charged to the electric department for its use.

In regard to the unoperated land in general, it is asserted by the company that it cannot make opportunities to dispose of any portion of it. If the time should ever come when disposition may be made of any part not likely to be required in the future, the proceeds, the company states, will, of course, be credited to capital. Until that time arrives it is, the company submits, unjust and inequitable to say that the company, which was compelled to acquire the whole of the property, if any, must carry any part of it as non-earning, dead property, and at the same time be paying interest and taxes upon it.

PAVING.

The tentative valuation shows a total value of paving of $22,560 cost new, and $20,945 present value. Of the total cost new $12,216 is assigned to the water department and $10,344 to the gas department.

The city contended that all or the greater part of this paving had been put down after the water and gas mains and services were laid and that the company had never been compelled to go to any expense in cutting through and replacing this pavement. For this reason, the city contended that no allowance for paving, not actually cut through by the company, should be included in the valuation.

The Commission has held in several earlier decisions that the value of paving, where no expense had been incurred by the company, should not be included in a valuation for the purpose of rate making. Reference is here made to the decision *City of Ripon v. Ripon Light and Water Co.* 5 W. R. C. R. 1, 10. Investigation of the records of the company shows that the total cost of the paving work done by the company in connection with main and service work has been about $2,518, figured on the basis of the unit prices used by the staff. This total is divided between the water and gas departments as follows: Water $540 and gas $1,978.

UNOPERATED PROPERTY.

In the tentative valuation the above item has been fixed at $25,341 reproduction value, and $21,008 present value. The details of these items are shown in table XXVII following:

TABLE XXVII.

UNOPERATED PROPERTY FROM TENTATIVE VALUATION.

CLASSIFICATION.	Cost of reproduction.	Present value.
Land:		
Part of tract at W. side hydraulic pumping plant—80%	$10,000	$10,000
Part of tract at old gas plant—25%	1,325	1,325
Part of tract at new gas plant—15%	2,675	2,675
Wells—6 driven wells at west side plant	793	785
Bldgs. and misc. structures:		
Dwelling at new gas plant	1,230	861
Carpet cleaning plant	432	302
Old pest house	....	40
Old stone dwelling	2,333	513
Sheds on old dwelling lot, old station	233	70
One 12x7x12 Laidlaw Dunn garden pump	383	294
Old poles—13	150	45
Meters—26	592	295
200 kw. generator	2,196	1,649
100 kw. generator	1,335	1.073
100 kw. generator	1,335	998
Portion of composite switchboard	328	82
Total	$25,341	$21,008

The question of unoperated land as apportioned by the staff was taken up under "Land" and need not be discussed again at this point.

No valuation is claimed by the company on the six driven wells included in the unoperated property by the staff.

The company states in regard to the buildings which the staff has considered as unoperated property, that these structures are all located upon property of the company, that they were so located when the property was acquired, and that the land which was necessary to the uses of the company could not have been acquired without the buildings. It appears that the dwelling at the new gas plant is used for storage purposes. The carpet cleaning plant is leased at $4 per month and the income credited to non-operating revenues of the gas department. The old pest house has been sold subsequent to the hearing and the proceeds credited to the gas capital account. The old stone dwelling was not occupied at the time of the hearing, but at times has been used by the company to house street laborers brought into the city for construction work. Sheds on old dwelling lot are used for storing pipe and fittings.

The company has treated the pump, old poles, meters and generators as stores and supplies and objects to their inclusion under unoperated property. It appears that most of the old poles have subsequently been used in construction work. The meters and generators have been sold.

DEPRECIATED VALUES.

In the appraisal of all property which is subject to deterioration with use, it is necessary not only to determine the cost of reproduction, but also its value as it exists at the date of appraisal, or, in other words, its present or existing value. The value of depreciable equipment may be said to consist of two elements: First, its value for the use for which it was designed; and second, its scrap or residual value at the end of its useful life. If we assume that the value when new is the cost of reproduction, then, at the end of its useful life the only value which remains is the scrap value. Between these two points the equipment is gradually decreasing in value. There is, however, much difference of opinion as to the progress of this decrease in value.

It is frequently assumed, and is strongly contended by the petitioner in this case, that the rate of depreciation is uniform, that is, that the decrease in value follows a straight line drawn between two points, namely, cost of reproduction and scrap value. While it is true, perhaps, that the physical decay of equipment begins at the moment it is placed in service, it must, on the other hand, be acknowledged that very frequently equipment which has been in use for a few months and has proved its adaptability to the service required of it has a greater value than the cost new of the untried machine. On the other hand, conditions are conceived where the equipment shortly after its installation is worth much less than its value as shown by a straight line depreciation curve, due to the fact that the equipment in question is unsuitable or improperly designed, constructed or installed. In the majority of instances, however, it would appear that there is only a slight decrease in the actual value of a unit as operative equipment during the early period of its life. No maintenance may be required for several years, and so far as a superficial examination would indicate, the unit is "as good as new." The fact that numerous instances of this kind can be pointed out has given use to more or less erroneous ideas as to the value of equipment which has been in service. No matter how remarkable the performance of a machine, a day will come when even the most casual examination will show that the value falls far below that of a new unit. Maintenance increases and efficiency decreases, and a period is reached when the unit is kept in service only by a large increase in operating expenses.

The prejudice against second-hand machinery is, to a considerable extent at least, an expression of general opinion that a machine depreciates more rapidly during the latter part of its life. It is a common saying that it pays to get the first wear out of a machine. The price which equipment will bring second-hand, however, is not indicative of its present or existing value as an operating unit.

It seems fairly certain, in view of the facts, that if we are to consider the value of a unit of equipment as installed and in operation, the depreciation will in general occur more slowly during the earlier than during the later years of its life, and that in general the value at all times will be somewhat above the straight line drawn from cost of reproduction to scrap value. It is, however, much easier to arrive at this conclusion than it is to indicate the course actually followed by the decrease in value. It is probable that the fairest representation of this course is the sinking fund curve. Whether a 4 per cent, 3 per cent or other curve is the closest to a fair and reasonable rate depends largely upon other factors, which can perhaps be closely ascertained only by careful investigations and clear knowledge of the surrounding conditions. Where proper depreciation curves have been kept in the past, the present or existing value of a property, as determined by inventory, inspection and appraisal, plus the depreciation reserve, should theoretically equal the cost new of that property.

There is, of course, no actual connection between the rate of depreciation of equipment and the rate at which money accumulates under a given rate of compound interest. The progress of depreciation must be assumed in any case. If we are to follow the proposition that it follows a curve instead of a straight line, it seems fair to assume that this curved line has a certain general form, and it would seem reasonable to assume that the 4 per cent sinking fund curve fairly represents the progress of depreciation under average conditions.

Many appraisers oppose the use of a curve of any kind or form, and rely upon the judgment of an expert as based upon the actual inspection of the equipment under consideration. Since, however, a great deal of equipment cannot be adequately examined in service, it is necessary to rely very largely upon age, and in such cases the appraiser actually depreciates upon an actual or mental curve which is based upon the more or less definite life table which is the result of his experience. More consistent and fairer results would appear to be obtained by the use of a life table compiled from the experience of a large number of experts in connection with a definite curve, even if the basis for the use of such curve rests, to some extent, upon assumptions which are more or less difficult to justify with exactness.

ALLOWANCE FOR INTEREST DURING CONSTRUCTION, CONTINGENCIES, ORGANIZATION, ETC.

Considerable testimony was introduced at the hearings and by reports of the expert witnesses called in these proceedings bearing upon the allowance which should be made to cover the items of interest during construction, engineering, legal work, organization expenses, omissions and contingencies. That these are proper elements of cost or value to be included in an estimate of cost of reproduction and existing value of the physical property of plants, such as are under consideration herein, has justly been recognized.

The Commission has discussed these items in detail in previous decisions. Reference is made especially to the decision in the case of *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 540. In the case before us the tentative valuation has allowed 12 per cent on the total cost of the physical parts of the plants to cover the items enumerated above. Witnesses for the respondent generally held that 15 per cent would be the minimum allowance which they would make in valuations of this character, while several witnesses insisted that a much larger percentage would be necessary to arrive at a true estimate. The city contended that, in view of the character of the work evidenced by the plants of the respondent, a 12 per cent allowance was ample, if not more than ample in this case. Lack of efficient management and organization and of engineering skill were, in the minds of the city's experts, evidenced in the present operating conditions of the plants.

These facts, the city maintained, should constitute sufficient grounds upon which to support or even reduce the allowance made in the tentative valuation.

No facts or arguments were brought out in these proceedings which have not been presented to the Commission in preceding cases, except those bearing on local conditions which may have influence on the allowance to be made in this instance. The contention of the petitioner that the allowance should be reduced because of the lack of proper engineering skill and supervision in the designing and construction of the existing plants, rests largely upon the criticisms made by the city's experts on the present arrangements of the several units and systems making up the property of the respondent. Whether these facts, if true, are of sufficient weight and importance to permit us to reduce the allowance in this case, appears doubtful. In this connection it may be noted that the date of the consolidation of the three utilities in Beloit into the present organization is comparatively recent; large sums of money have been expended since the consolidation in rehabilitating the several plants, reinforcing them, and in perfecting a working whole and in extending the systems. That the plants do not present, perhaps, as efficient and perfect a combination of units as a utility which has had control of the separate departments since their construction or for a long period of years and which has been able to co-ordinate the work of the several departments, is not surprising. Whether the respondent has pursued the proper policy since the consolidation in these respects, is a matter of more or less difference of opinion. Experts may and do express varying views on such questions. Extended discussion of these questions will not be attempted at this point.

On the other hand, certain testimony introduced by the respondent in connection with the question of the allowance under consideration should perhaps be considered briefly at this time. Evidence has been brought before the Commission in several proceedings of the nature of the one discussed herein, in regard to the wide margin often found between the estimates of the cost of construction of properties similar to respondent's and the actual cost of the same as determined after construction is completed and the plants are in operation. The Commission has often been informed by engineers and by those who have assisted in financing the organization and construction of properties such as respondent's, that the actual cost of the properties quite uniformly exceeds the estimated cost. One engineer, when asked as to what proportion or by what amount he would increase the estimate in order to cover the actual cost, stated that his allowance for engineering, omissions, etc., would depend largely upon the experience and qualities of the person or persons in charge of the design and construction. He stated that with certain men in charge he would make a small allowance, while with others of less experience in charge he would place his figure as high as 20 per cent or more. These remarks aid us in making the distinction, which should be emphasized, in regard to the difference between estimates of construction cost and estimates of the cost of reproduction. It is ordinarily impossible for the designer of plants, such as those involved herein, to foresee the exact conditions and contingencies which may be encountered in the actual construction work. This is true to some extent even where specifications and estimates are drawn by men of large experience and familiarity with local conditions. Again, it is seldom but what departures are made from specifications, due to new inventions, changes of policy on the part of those in control of the work, the encountering of unforeseen conditions, and for numerous other reasons. In fact, specifications are often purposely left open in some particulars to permit of changes due to later decisions by those in charge. On the other hand, the cost of reproduction of such properties is made after the plant has been completed and with all units and equipment in place and the plant in operation. Access is often had in valuation work of this kind to the books and records showing the actual cost of construction of all or a part of the physical property. Again, where unusual conditions were met with in the construction work which called for particular skill and caused additional expense not provided for in the original estimates, these circumstances are not commonly permitted to escape the attention of those conducting the inventory and appraisal.

While there is no desire to place undue emphasis on these matters, it is believed, however, that these are facts worthy of careful consideration in arriving at reasonable conclusions in the questions before us in this connection. It seems clear that testimony of a general nature directed to show the discrepancies between estimates of construction cost and actual cost should not be permitted to exert too great an influence in appraisals where cost of reproduction is the figure sought for and not the estimates made before construction. The difference between estimated cost and actual cost may be due to several factors, such as inexperience of the estimator, unusual and unlooked for difficulties in constructing, omissions and changes in the specifications, or additions or extras not described therein. In view of these facts it would seem of great importance that the causes of the discrepancies be analyzed and their relevancy and bearing on the determination of cost of reproduction, as distinguished from estimated cost of construction, be determined.

On the other hand, there are expenses which are quite often incurred in the construction work which are not represented in the structures as completed. A large amount of temporary work is often necessitated which does not appear when the inventory is made. These and other facts must also be given due consideration. Where men of wide experience find, that with original estimates carefully prepared and with specifications closely adhered to, the actual completed cost quite uniformly exceeds the estimated cost, it would seem unfair and unjust to the owners to place the appraisal for rate-making purposes at any figure which is lower than the amount determined by such experience as that described.

The preceding discussion has been devoted largely to the items of engineering and supervision, omissions and contingencies. The other items included in the allowance of 12 per cent made by the staff have been analyzed carefully in previous decisions of the Commission, and what has been said applies in this case. In view of the testimony of both a general and local nature which has been introduced, and in view of farther investigations as regards the facts in this particular case, we believe that, while the allowance cannot be reduced, we have, at the same time, not discovered good grounds upon which to increase it in this instance.

Piecemeal Construction.

Respondent would add from 10 to 15 per cent to the valuation of the physical property by reason of the fact that continuous contract construction is, on the whole, much less expensive than piecemeal construction. This claim is based largely upon the assumption that the appraisal made in this instance was based on continuous construction costs.

Respondent asserts that the testimony discloses that piecemeal construction has entered into the plants in question to a marked degree; that it cannot be said of the valuations claimed by the company that there was taken into account the increased cost of piecemeal construction, nor is it understood that the valuations of the staff as contained in their summary included this element, but rather that such valuations were made on the basis of continuous construction; that if it is to be assumed that the staff's valuations recognizes the element of piecemeal construction, then the greatest consideration should be given by the Commission to the contention that these valuations are too low. This is especially true, respondent asserts, as regards the allowance of 12 per cent made by the staff to cover interest during construction, engineering, contingencies, etc.

The city contends, on the other hand: (1) that piecemeal construction affects but a very small part of the plant, insofar as actual construction is concerned; (2) that it is primarily an item of cost, and not of value; that it is the value of the plant as it at present exists, and not its cost, that is the ultimate fact to be determined; (3) that there are important factors in the element of piecemeal construction that even tend to reduce the cost, such as the increased prices of labor, etc., due to the large demand contingent upon continuous construction or contract work, the advantage which may be taken of favorable markets when construction is piecemeal and extended over many years, the fact that regular employes may be used at convenient and advantageous times, and the fact that work may often be done to better advantage, and more carefully and efficiently, by piecemeal.

The Commission has discussed the question of an allowance for piecemeal construction in previous decisions. Reference is made to the case of *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 546—549. There would appear to be no necessity to repeat the discussion presented therein. That some consideration should be given to this item, should be admitted. That the allowance made should reach the proportion claimed by the respondent, we do not believe the facts regarding the history of the plants and the methods used by the staff in its valuation will permit.

WORKING CAPITAL.

It is the view of the company that in addition to its estimate of stores and supplies, the allowance for working capital should be $45,000. The division of this amount between the three departments, as proposed by the company, is shown in the following statement:

Water Department:	
Stores and supplies	$2,857
Additional working capital	10,000
Gas Department:	
Stores and supplies	$16,469
Additional working capital	20,000
Electric Department:	
Stores and supplies	$22,406
Additional working capital	15,000

"Plants which are running or in actual operation, must have working capital as well as fixed capital. In this case the latter, or the fixed capital, is largely represented by the cost of reproducing the plants, * * * while the working capital is, in part, represented by the figures given * * * for stores and supplies. The stores and supplies * * * given, however, do not represent all the working capital the plants require. Plants of this kind, the same as practically all other business enterprises, must have on hand a reasonable cash balance and other current resources in order to operate economically and effectively. That this is the case, is almost self-evident." *Cunningham et al. v. Chippewa Falls W. & L. Co.* 5 W. R. C. R. 302, 316. See also *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 550.

The value of stores and supplies on Jan. 1, 1909, as given in the tentative valuation, is as follows:

Water department	$4,170
Gas department	13,347
Electric department	10,189
Total	$28,153

Turning to the balance sheets of the utility as a whole, there appear among the quick assets and liabilities of the company about Dec. 31, 1908, June 30, 1909, and June 30, 1910, the following items:

	Dec. 31, 1908.	June 30, 1909	June 30, 1910.
CURRENT ASSETS:			
Materials and supplies	$20,224 65	$31,491 69	$25,259 29
Cash	8,836 58	9,467 54	3,594 92
Accounts receivable	23,973 50	22,662 49	24,849 75
Total	$53,034 73	$44,686 64	$53,703 96
CURRENT LIABILITIES:			
Accounts payable	$1,167 75	$13,904 32	$10,241 67
Taxes accrued	....	3,644 83	....
Interest accrued	....	16,343 95	5,474 39
Total	$1,167 75	$33,893 10	$15,716 06

The revenues from the gas and electric consumers are collected monthly, being payable on or before the 10th of the month following the month for which the bill is rendered. The water rates, under the flat rate system in use in Beloit, are payable quarterly and in advance, a penalty being added in case of payments which are not promptly made.

In view of these and other facts regarding the methods of conducting the business of the company, it is believed that a working capital of from $40,000 to $45,000 is fully adequate under the present and probable future conditions, or an amount about $15,000 in excess of the present value of the stores and supplies.

WATER POWER.

Expert testimony has been introduced by both the city and the company in regard to the value of the water power owned by the respondent. The company claims that the value of the water power in question is at the lowest estimate $150,000. The city's experts, on the other hand, while conceding that a certain value attaches to this water power, will not concede the lowest value claimed by the company, and would place the value as between $27,167 (Fowle's report) and $50,000 (Evans' report). The staff has submitted no estimate of the value of the water power.

Power available. The water power considered herein has been developed and is under the control of the Beloit Water Power Company, a corporation chartered by the state of Wisconsin on March 7, 1871. It appears that the capital stock of the water power company was fixed at $80,000 and the ownership divided into 800 shares of a par value of $100 each. The

Beloit Water, Gas and Electric Company, respondents in this proceeding, owns 326 shares, covering 5,433 1/3 inches, which entitles it to 40.75 per cent of the power.

The respondent company utilizes its share of the water power by three separate installations.

1. The electrical generating station on the east side of the river, adjacent to the end of the dam, is a combined steam and water power plant. The hydraulic equipment consists of one 62 inch vertical Sampson water turbine, and one 60 inch New American turbine, each geared to a horizontal shaft which is belted to a line shaft that is in turn belted to two 200 kw. alternating current generators.

2. The "red mill" pumping station on the west side of the river is equipped with one 35 inch vertical Leffel water turbine, driving one 8½ inch by 12 inch Fairbanks-Morse duplex power pump.

3. The "stone mill" plant consists of one 40 inch Sampson turbine and one 60 inch Merrill-Huston turbine, driving two 8½ inch by 12 inch Fairbanks-Morse duplex power pumps. Under normal conditions but one of the wheels is used, the second one being called into service as a relay or to furnish fire pressure.

It appears that the experts for both the city and the company are substantially in agreement as regards the stream flow of the Rock river at Beloit. In Mr. Williams' report we find "The mean normal discharge below 7,000 cubic feet per second is 3,500 cubic feet." As regards the average minimum flow, Mr. Williams arrives at 330 second-feet as the most reliable estimate. The company's portion of this low water flow is 132 second-feet. Mr. Williams notes that, so far as gauging records extend, extreme low water has never occurred at the time of the greatest demand on the plant.

The city claims that the 9 foot head reported by Mr. Williams and used in his computations is excessive. Mr. Mead accepts the 9 foot head reported by Mr. Williams, and Mr. Orbison assumes 8.5 feet as a "safe and conservative estimate." Mr. Fowle, in his report, states that measurements made by himself showed a head varying from 6½ to 9 feet under varying conditions. Mr. Fowle then adopts an average head of 7 feet in his computations. The differences arising from the use of the 7 and 9 foot heads will be touched upon later. Mr. Williams states that

"When both the west side pumping plants are working at their usual rate, they will pump into the mains about 1,200,000 gallons in 24 hours, allowing 15 per cent for slip of pumps. The approximate total lift is 156 feet. This represents 33 horse power net. For the year beginning March 1, 1908, and ending Feb. 28, 1909, the total amount of water pumped at these two stations was 311,916,000 gallons, or an average of 854,000 gallons in 24 hours. The equivalent of this work expressed in electrical power at the switchboard is 228,000 kw. hrs. for the year's work, being one kw. hr. for 1,370 gallons pumped. The maximum working capacity of the plants in pumping is 36 kws., except under fire service conditions.

"With a head of about 9 feet, the hydro-electric plant has reached a load of 140 kws., though its ordinary working load cannot be placed higher than 124 kws. Combined with the west side pumping plants, the equivalent water power now utilized with the present installations, as operated, have a capacity of about 160 kws. With another 60 inch turbine added to the hydro-electric installation * * * the capacity of this plant would be about 180 kws., and by utilizing fully the capacity of the wheels in the west side plants, their capacity could be increased to 70 kws., making the total possible capacity of the water power plants as now installed about 250 kws."

The testimony in regard to the maximum economical development of the water power at Beloit is well summarized in the following statements submitted by Mr. Williams and Mr. Fowle. Mr. Williams reports that

"The total amount of water power that can be economically produced from 40.75 per cent of the flow at Beloit, is much greater than the present plant will yield, even after all the turbine wheels installed and on hand have been fully utilized to an approximate capacity of 250 kws. How much greater it will be, depends not only on the discharge of the river, but also upon the total output of the electrical station, the uniformity of the loads from month to month and day to day, the daily load factor, the capacity of the new plant installed, as well as upon the available pondage. * * * It appears that the average monthly factors vary from 38 per cent to 48 per cent. The average yearly factors being about 42.5 per cent. The available power is based upon two direct connected hydro-electric units, with a switchboard capacity of 360 kws., each at three-quarter gate for the turbine wheels, and a head of 9 feet, which with the aid of head increasers can be maintained at high water. Such an installation will give 450 kws. for each unit at maximum loads, or 900 kws. peak load capacity for both."

Mr. Fowle's report reads:

> "A fair development at Beloit is from 1,200 to 1,400 hydraulic horse power, without allowance for pond storage. A storage capacity sufficient to store the water at this rate of flow for fourteen hours a day would permit the development of 2,880 to 3,360 hydraulic horse power on a ten hour basis. * * * The Beloit Water, Gas and Electric Company is unlike other users, however, in the respect that their plants operate twenty-four hours a day, and the importance of pondage in considering their use of water is not so great as in the case of ten-hour users."

It is apparent that there exists a difference of opinion as regards the maximum economical development of the water power in Beloit for the purposes of the Beloit Water, Gas and Electric Company. The difference, it would seem, arises from the use of different values for the several factors which influence the final conclusion as regards maximum total development. Among these factors may be mentioned the head which is assumed by Mr. Williams as 9 feet and by Mr. Fowle as about 7 feet.

Value of Water Power.

The company called as witnesses in regard to the value of the water power of the respondent, Mr. Williams, Mr. Mead, Mr. Orbison and Mr. Salmon. The city had the testimony of Mr. Evans, Mr. Wheeler and Mr. Fowle.

The following quotations from the reports submitted by several of the above named witnesses describe in a general way the basis upon which the value of the water power in question was arrived at. Mr. Williams states:

> "The value of water power in general is almost wholly dependent upon local conditions which create a demand therefor, and must be measured by the saving which can be effected by using it instead of steam power. Its value to the Beloit Water, Gas and Electric Company is also dependent upon the place which the hydraulic plants fill in the total aggregation, and upon the saving in the cost of operation and in interest and depreciation when used as a substitute for steam power."

Mr. Fowle, while he bases his estimate of the total value of the water power upon what he considers the market value, states that "the power is destined to become more valuable in the future as the price of coal rises and it will become profitable to develop it to a greater extent than now."

Mr. Orbison expresses his views as follows:

"Investments in water power enterprises are becoming more attractive for the reason that the values will surely increase as the price of coal tends upward, owing to the greater consumption and the advance in the cost of mining. The chief item of saving in the operation of the water power plant over that of a steam plant is the coal consumed."

Mr. Mead states:

"The value of a water power may be estimated on the basis of the saving actually effected by its use, compared with the use of such other method of developing power as would be normally used were the water power not available. * * * In such a comparison the capitalized value of the extreme maximum development should not be used, as such a value would, in its practical outcome, ordinarily lead to the adoption of the more common method of power and development with which the comparison is made; but the value should be so placed as to make the development of the water power an object to the plant considered."

It seems clear from the expressions of opinions thus made and from the general practice of engineers and other men in valuing water powers that the saving effected by the use of the water power over steam power, especially, measures the value of the water power. Other methods of appraisal are used and have been mentioned by the witnesses in these proceedings, namely, rental value and market value. These latter methods, however, are quite often open to objections which destroy their reliability and it appears that it is almost always necessary to fall back upon the method of calculating the saving over steam power and then, by capitalizing this saving, arrive at the total value of the water power. The Commission has commented upon this and other methods of determining the value of water power in earlier decisions.

"From a purely commercial point of view this method of estimating the value of water power rights may, in the main, be sound. But it is not so clear that this can be said for it when the question is regarded from the point of view of public policy. This method, as stated, places water and steam plants on the same basis. By doing this it necessarily diverts all the advantages that may accrue from such water powers from the public to the private owners. In other words, it appears to deprive a locality of the natural advantages it might otherwise derive from being located near such water powers. If water rights are private property under the law, then all the benefits which accrue from these rights would probably go to their private owners. If, on the other hand, water power rights are public rights rather than private rights, then it would also seem that the public ought to share in any benefits that may be derived from such rights." *Ross et al. v. Burkhardt Milling & El. Power Co.* 5 W. R. C. R. 139, 147.

Based upon the methods and assumptions outlined above, the witnesses in this proceeding have arrived at values of the water power owned by respondent ranging from $27,167 to $268,000. The company insists upon a valuation of $150,000 as the lowest figure.

It is to be noted that the conditions in Beloit are somewhat different than the conditions found in the case to which the decision above quoted from applies to. In the proceedings referred to herein the claim was made for value of the water right as a separate and distinct value from that of the dam, etc., or cost of development of the water power. In the instant case the water power is not owned directly by the respondent, but is held by another corporation, known as the Beloit Water Power Company, in which the respondent owns 40.75 per cent of the capital stock. It seems clear, then, that the values claimed in this case cover not only the physical property represented by these shares of stock in the water power company, but also cover the value of the water right controlled by this corporation. The company insists that "it is entirely manifest, however, that the actual value of the company's water power rights are not to be measured on the basis of the amount of assessments paid in to the water power company."

Referring further to the method of measuring the value of a water right by the saving over steam power effected by the use of such power, it is necessary to inquire closely into the relations between the water power and steam power in the particular plant under consideration, for it is obvious that where steam power is necessary as an auxiliary to the water power, that the saving effected in such case cannot be measured by the actual saving with the steam plant operating as an auxiliary. Such a method of calculating the saving and thus the value of the water right would result in a larger value per horse power for the imperfect water power than would be the case for a perfect or complete water power, calling for no steam auxiliary.

In aiming at the value of water power, Mr. Williams lays down the following rule: "The value of water power in general is almost wholly dependent upon local conditions which create a demand therefor, and must be measured by the saving which can be effected by using it instead of steam power." Commenting on the value of the water power in question, Mr. Williams says: "Its value to the Beloit Water, Gas and Electric Company is also dependent upon the place which the hydraulic plants fill in the total aggregation, and upon the saving in the cost of operation and in interest and depreciation when used as a substitute for steam power."

Selecting a period of 107 days—Nov. 14, 1908, to Feb. 28, 1909, inclusive, Mr. Williams shows the total work done by the electric plant, measured in kilowatt hours output, the work done by steam separately, and the total amount of coal consumed for each day of the period covered. From these figures several curves were plotted. One curve shows the total work done by steam exclusively, one the total work done by both water and steam, and another shows the coal used by the steam machines. From these a fourth curve is deduced, which represents the total amount of coal which would have been used had all the work been done by the steam plant and none by the water power equipment. Mr. Williams estimates that there was a saving of 814,200 lbs. of coal effected during the period Nov. 14, 1908, to Feb. 28, 1909, inclusive, by the use of water power, and that the total coal that would have been required if all the work had been done by steam was 3,238,800 lbs.

Mr. Williams then states: "If the actual coal saved is taken as the difference between the coal used and that which would have been required if all the work had been done by steam, it would have been approximately 816,000 lbs., or 4.8 lbs. per kilowatt hour, of water work. This is 408 tons, which at $2.40, the average cost of coal, gives a saving of $979.20, or 0.576 cts. per kilowatt hour."

Having shown that a saving of 4.8 lbs. of coal per kilowatt hour was effected for each kilowatt hour of work done by the water power instead of by steam, Mr. Williams multiplies this unit by the total work done by water power in both electric and pumping plants and arrives at a total saving in coal of 1,886.4 tons for the year 1908, or in money the saving was

$4,527. Mr. Williams finds the total station cost of operating the electrical plant for the year 1908, including coal, labor, repairs, supplies, etc., was $15,586, equal to a cost of 1.22 cts. per kw. hr. He then finds that if the work, including the pumping equivalent, had all been done by steam, the station cost would have been:

Station cost as above	$15,586 00
1,886.4 tons of coal additional at $2.40	4,527 00
One additional coal passer	540 00
Total	$20,653 00

This is equal to a station cost of 1.39 cts. per kw. hr., reduced from the total equivalent output of 1,486,000 kw. hrs. Mr. Williams, from these computations, arrives at a total saving for the year by use of water of $5,067. This amount is increased to $6,500 to measure the saving during a normal year, as it was claimed by Mr. Williams that, had the year been normal as far as the water flow is concerned, the water power work would have been 830,000 kw. hrs. rather than 571,000 kw. hrs.

After making some computations on the investment and operating costs with the installation of the then proposed new hydro-electric plant, Mr. Williams estimates that with the improved utilization of the water power the saving will be increased to $0.75 per kw. hr., including interest on capital and depreciation. He further estimates that by the time the load for the year is doubled, the saving will be at the rate of about $17,000 per annum, and that by the time the load has been trebled, the saving will be at the rate of $22,500 per annum.

Prof. D. W. Mead, in his report upon the value of the water power owned by the respondent, outlines three methods by which the value may be determined. Prof. Mead's report is in part as follows:

"First: The value may be measured by the market value of similar water power at such locality, provided such market value can be clearly established. Such value should not be measured, however, by the price demanded by parties having a monopoly of such power. Neither should it be measured by prices asked by owners having extra power for which they have no use and on which they are anxious to realize. It should be measured by a price fixed on the basis of what may be fairly demanded by parties owning power and fairly and profitably paid by parties desiring to purchase such power under the particular conditions of local use."

Regarding this method of fixing the value of water powers, Prof. Mead says:

"Such a measure of value is usually difficult, if not impossible, to apply except where large water power developments are owned in common by numerous users as is the case in many of the large eastern water powers."

The second method suggested by Prof. Mead is described as follows:

"The value of a water power may be estimated on the basis of its rental value or the capitalized earnings which may be realized from the use of power under the conditions of its local use. This is a basis more readily applied and more definite and positive in its results. It should be modified by the probable permanency of the demand and so reduced as to make such capitalized investment unquestionably attractive."

Prof. Mead stated that water power rentals in Wisconsin vary widely with the demand for power. By comparison with powers leased under conditions similar to those prevailing in Beloit, he considered $12.50 per theoretical horse power as a conservative estimate of the value of the Beloit power on such a basis. With 1,500 theoretical horse power, the annual rental would be $18,750.

Prof. Mead's third method is suggested in these words:

"The value of a water power may be estimated on the basis of the saving actually effected by its use,—compared with the use of such other method of developing power as would be nominally used were the water power not available. The saving effected should be estimated on the basis of interest, depreciation, repairs, maintenance and operation of both classes of plants considered, and the contingencies and flexibility of service must also be given due weight. In such a comparison the capitalized value of the extreme maximum development should not be used, as such a value would, in its practical outcome, ordinarily lead to the adoption of the more common method of power and development with which the comparison is made; but the value should be so placed as to make the development of the water power an object to the plant considered; that is, an actual saving should be entailed by its ultimate use on the basis of the value fixed."

Prof. Mead, after reviewing the conditions as regards the use of the power in Beloit by respondent, agrees with the conclusions reached by Mr. Williams and computes the annual saving to be as found by Mr. Williams.

Mr. T. W. Orbison testified that he had examined the Williams report and was also familiar with the conditions in Beloit. When asked what value he would place upon the water power owned by the respondent, he stated that he believed the power worth $150,000 to the company and that he would not advise them to sell it for any less than that figure.

Some testimony was given by Mr. Salmon who had been intimately connected with the water power development at Beloit, with regard to the price at which certain sales of power had been made. Mr. Salmon's testimony tended to the conclusion that apparently few transfers have been made in regard to which the price is well known and that such sales as have been made have been accomplished under conditions which make a comparative basis quite unreliable in this instance.

Mr. Frank F. Fowle testified that he had examined the records of assessments of the Beloit Water Power Company. The expenses of the power company are borne by assessment. He found that the first assessment was levied on Nov. 10, 1873, and the total up to June 20, 1908, was $90,240, or an average of $2,578 per annum for 35 years. The original dam was washed out in 1881 and about $4,000 was expended for repairs.

> "On this occasion the flood washed a very deep hole under the dam and many carloads of stone were required to fill it. In the fall of 1881 the remainder of the old dam was washed out by high water, and about $4,800 was expended in repairs at once and some additional amount later. In 1904 the old dam was replaced by a new one of concrete, costing about $8,000."

Mr. Fowle found that sales of stock had been infrequent and that he was reliably informed that the price ranged from $4 to $10 per inch of water. At a par value of $100 per share, or $6 per inch, the total value of the power is $80,000. In view of all the facts available, Mr. Fowle believed that an estimate of $5 per inch, or $83.33 per share, represented a fair value of the power. This places a total value of $27,166.67 on the 326 shares owned by the respondent.

Mr. Evans, who had examined Fowle's report and who was more or less familiar with conditions in Beloit, stated that in arriving at the value of such a water power the saving effected by the use of the power over that of steam, the market value, the reliability of the power and the demand for it were all elements to be taken into consideration. Mr. Evans believed that

$50,000 was a liberal estimate of the value of the respondent's water power.

The daily station records of the electric plant for the calendar year 1910 were obtained and a careful analysis made of the operation of the plant from day to day, as shown by the records. The result of this analysis may throw some light upon the relation of the water power to the operation and output of the plant as a whole. These records show the current generated by steam and water power each day, the coal consumed, the maximum demand and coal per unit generated.

The maximum and minimum days of each month, measured by the maximum demand on the station, are shown below, with the demand and other data:

MAXIMUM AND MINIMUM DAYS.
1910.

MONTH.	DATE.		DEMAND KWS.	
	Max.	Min.	Max. day.	Min. day.
January	5	16	610	250
February	2	6	550	280
March	7	27	480	250
April	8	3	460	240
May	23	1	460	240
June	11	26	425	230
July	30	17	430	200
August	6	21	450	240
September	10	18	460	270
October	21	9	600	275
November	29	6	690	315
December	14	4	700	300

The maxium demand on the station occured in December, 1910, and amounted to 700 kws. The lowest reading, 425 kws., was taken in June. That year appears to have been one of unusually low water and it is noted that on the maximum days of July and August, 1910, no part of the load was carried by the water power. Reference to the outputs show that for a large part of the month of August no current was being generated by water power. Also during the months of October, November and December the steam power was carrying by far the greater part of the load. It is interesting at this point to note the performance of the station under the conditions described, as the performance of the steam power, when burdened with all or nearly all of the load, will indicate quite closely the probable economy of the plant if operated entirely by steam power.

During the month of August, when out of a total output of 140,737 kw. hrs., only 13,705 kw. hrs., or about 9.7 per cent, were generated by water power, and when there were days when no water power was used, we find the number of pounds of coal required per kw. hr. (steam generation) varying from 4.6 to 10.0, the average being about 6.3 lbs. of coal per kw. hr. Excluding the days when the water power was used, we obtain an average of about 5.8 lbs.

In the month of October the daily output of the water power never exceeded 1,500 kw. hrs. and averaged 438 kw. hrs. per day. The total output for the month was 145,708 kw. hrs., of which 12,708 was generated by water power and 133,108 kw. hrs. by steam power. The conditions for October, November and December are summarized in the following table:

MONTH.	Total output.	Output of water power.	Output of steam power.	Pounds of coal per kw. hour generated by steam power.		
				Average.	Maximum.	Minimum.
October...........	145,708	12,708	133,108	5.6	11.8	4.2
November.........	169,420	16,000	153,418	6.0	10.0	3.9
December........ ..	175,115	23,860	151,255	5.7	11.0	4.7

The actual experience of a number of Massachusetts and Wisconsin steam plants in the outputs and demands similar to Beloit show that from 4.5 to 5.0 lbs. of coal per kw. hr. represents a liberal average of the results obtained by these plants. The actual results obtained in Beloit as evidenced by the daily station records indicate clearly that with its present improved steam plant the company may reasonably expect to secure an efficiency equal to other plants of similar size and construction. The average cost of coal per ton of 2,000 lbs., delivered at the plant, is reported by the company as $2.34 for the year ending June 30, 1910.

As previously noted, the capital stock of the Beloit Water Power Company was originally fixed at $80,000. Authority was also given in the charter to increase the capital stock to $160,000. Assuming that this amount has been required to develop the power, obtain pondage rights, etc., the respondent's share of the total investment would be about $64,000. The entire amount which has been expended in the construction of the dam, head races, etc., or physical property, will probably be covered by $40,000. The cost of reproduction of the structures, it appears, would be somewhat less than this amount. The costs of attendance, and of maintenance, etc., are met by assessments on the several shareholders. These assessments have been charged by respondent to operating expenses, and paid for out of the earnings of the plants.

These facts and opinions have been presented rather fully because of their bearing upon the operation of the respondent's power plants, the utilization of the water power facilities, and the value of this water power as considered in relation to rates for service.

ANALYSIS OF BALANCE SHEETS.

The original cost of the property, subsequent additions to and investment in the plants, and the present value and cost of reproduction, are elements which must largely determine the investment upon which the respondent is entitled to earn a reasonable return. The greater part of the testimony and arguments brought before the Commission in these proceedings has been directed along the line of the valuation of the physical property of the respondent. The value of nearly every item included in the tentative valuation has been the subject of contest. Especially is this true as regards the water works department. In view of this fact, and in view of the further fact that but little or no information is available regarding the original cost of the plants and subsequent additions and extensions, we have devoted considerable space to the discussion of the values of the items covered by the appraisals of the physical property of the respondent.

In the light of the testimony and the facts revealed by the testimony and investigations, we are convinced that the valuation determined by the staff is, on the whole, fair and reasonable. Some minor changes in apportionment between the several departments have been suggested and some additions should perhaps be made to the valuation as submitted by the staff. On the other hand, the item of paving will suffer a decrease, as already pointed out. With these changes in mind, and after a careful review of the facts, we believe that the total valuation of respondent's physical property, as found by the staff, should stand.

The Beloit Water, Gas and Electric Company is the result of a consolidation of three separate companies in Beloit, namely, the Beloit Water Works Company, the Beloit Gas Light and Coke Company, and the Beloit Electric Company. Articles of incorporation of the Beloit Water, Gas & Electric Company were filed with the department of state Jan. 20, 1906.

Unfortunately the books and other records of operation of the separate utilities existing before the consolidation in 1906 have not been preserved, and practically the only information which can be obtained at this time covering these earlier years before the consolidation must come from the testimony of men more or less intimately connected with the utilities preceding the consolidation. The testimony of these men, while clear as regards certain transactions and covering certain periods, is not as clear as regards other periods and other transactions with which their duties and relations did not offer the opportunity to become familiar. There are, then, a number of years and several financial operations during the lives of the several companies existing previous to the consolidation in regard to which no satisfactory evidence is available. A discussion herein of the facts which the testimony has revealed in regard to these operations which were known by the witnesses called, would seem profitless in view of the greater part which is unknown, and will, therefore, be attempted only insofar as these facts may have a direct bearing on the questions at issue.

The respondent operates three utilities in the city of Beloit, namely, water, gas and electric. The most important factor in determining the rate of charge is the cost of service. To ascertain this cost per unit of production for each utility, presents no simple problem. Each utility must stand on its own feet; gas consumers cannot be expected to carry any of the burdens of the water consumers; the water consumers, again, cannot be charged with part of the costs of the electric service. A large portion of the investment of the company, and a large part of the operating expenses of the plants, are directly chargeable to a particular utility and a particular class of service. The remaining investment and expenses are common to two or three utilities, and such equipment and costs must be apportioned between the utilities on fair and reasonable bases. Proceeding farther, we find that after the several utilities are each made to carry their proper share of the total burden, we are then confronted with the necessity of separating the costs of each utility among the several branches of service given by each utility. In the water utility we find public service or fire protection as distinct from the domestic and industrial service; the electric utility furnishes energy to commercial lighting consumers, commercial power consumers, and public or street lighting. These separate branches of service have their peculiar characteristics of demand and use, and require more or less special equipment. In order, then, that the apportionments made necessary by the above described divisions of service may be fair and equitably made and clearly understood, it is necessary to examine carefully into the operation of the plants and a large mass of operating statistics must be studied and in turn classified and adjusted to the proper basis.

The assets and liabilities of the company are found in the balance sheets. Balance sheets of the plant as a whole are shown in the following table XXVIII, and are as reported by the company and as found by examination of the books of the company. The balance sheets, as shown in the table, extend back far enough to cover the operations since the consolidation of the utilities in 1906.

It appears that the book value of the plants on Feb. 5, 1906, was $909,249.26. Capital liabilities amounted to $925,000, divided as follows:

Capital stock preferred	$100,000
Capital stock common	125,000
Funded debt	700,000

From the testimony it appears that the present management did not directly effect the consolidation of the three utilities. The consolidation, which was accomplished early in February, 1906, was carried through by a Cincinnati firm known as Rich & Company. It seems that these people were unable to finance the proposition and the present management took over the consolidated properties in July, 1906. The first balance sheet shown in the table is, then, of about the date the consolidation was effected and before the present management took hold.

TABLE XXVIII.

BALANCE SHEETS.

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Utility as a whole.

	Feb. 5, 1906.	Dec. 31, 1906.	Jan. 1, 1908.	Dec. 31, 1908.	June 30, 1909.	June 30, 1910.
ASSETS.						
Property and Plant:						
Cost beginning of year	....	$909,249 26	$1,346,752 08	$1,573,577 35	$1,596,883 99	$1,657,201 99
Constr. and equip. current fiscal year	....	46,752 08	226,825 27	64,542 50	60,318 00	38,027 40
Surplus account	....	15,750 74	....	....	....	....
Plant and franchise	....	375,000 00	....	....	....	....
Cost close of year	$909,249 26	$1,346,752 08	$1,573,577 35	$1,638,119 85	$1,657,201 99	$1,695,229 39
Investments	....	....	....	10,000 00	10,000 00	10,000 00
Reserve, sinking and special fund assets	....	....	....	....	....	....
Current Assets:						
Cash	3,130 11	5,833 40	7,785 83	8,836 58	9,467 54	3,594 92
Notes and bills receivable	42 38	....	....	....	3,000 00	3,000 00
Accounts receivable	8,203 10	19,219 05	29,135 57	23,973 50	22,662 49	24,849 75
Interest and dividends receivable	....	....	....	....	....	180 00
Material and supplies	4,801 15	7,599 07	12,670 48	20,224 65	31,491 69	25,259 29
Misc. current assets	....	....	91 43	63 72	....	46 70
Prepaid Accounts:						
Prepaid insurance	....	279 63	....	131 12	678 03	599 16
Misc. prepaid accounts	....	....	15 00	....	....	87 50
Open accounts	....	....	....	....	....	....
Bad debts	....	....	....	439 85	433 35	411 41
Suspense account	....	....	....	3,411 55	12,194 78	18,601 70
Deficit	....	....	....	....	....	....
Total assets	$925,426 00	$1,379,683 23	$1,623,275 66	$1,705,200 82	$1,728,194 79	$1,781,859 82
LIABILITIES.						
Capital Liabilities:						
Capital stock preferred	$100,000 00	$100,000 00	$100,000 00	$100,000 00	$100,000 00	$100,000 00
Capital stock common	125,000 00	500,000 00	500,000 00	500,000 00	500,000 00	500,000 00
Funded debt	700,000 00	700,000 00	700,000 00	700,000 00	700,000 00	700,000 00

Reserve, Sinking and Special Fund Liabilities:						
Depreciation reserve fund...						
Special funds		15,379 85	17,204 03	21,726 51	*1,488 26*	13,075 49
Current Liabilities:						
Notes and bills payable		27,000 00	274,043 17	353,504 10	359,050 00	405,000 00
Accounts payable	410 00	17,145 73	2,465 61	1,167 75	13,904 32	10,241 67
Deposits	16 00	88 45	1,110 97	1,158 53	1,413 03	916 04
Misc. current liabilities					94 18	
Accrued Liabilities:						
Taxes, accrued					3,644 83	
Unmatured interest on funded debt accrued					14,995 84	5,023 60
Unmatured int. on notes and bills payable accrued					1,348 11	*451 79*
Misc. liabilities accrued						115 44
Surplus		20,069 20	27,851 88	27,643 93	35,252 74	47,035 79
Total liabilities	$925,428 00	$1,379,683 23	$1,623,275 66	$1,705,200 82	$1,728,194 79	$1,781,859 82

In order to more clearly note the changes which have taken place since the consolidation, or in effect since the present management assumed control, the following statements have been prepared. These statements will show more or less clearly the transactions of the company and will show from whence the receipts were obtained and where applied:

*ANALYSIS OF BALANCE SHEETS.

Feb. 5, 1906—June 30, 1910.

APPLICATION OF THE RECEIPTS.

Increase in Assets:	
Property and plant	$785,980.13
Investments	10,000.00
Cash	464.81
Notes and bills receivable	2,957.62
Interest and dividends receivable	180.00
Material and supplies	20,458.14
Misc. current assets	46.70
Prepaid insurance	599.16
Misc. prepaid accounts	87.50
Bad debts	411.41
Suspense account	18,601 70
Total increase in assets	$856,433.82

SOURCES FROM WHICH RECEIPTS WERE OBTAINED.

Increase in Liabilities:	
Capital stock, common	$375,000 00
Special funds	13,075 49
Notes and bills payable	405,000.00
Accounts payable	9,831.67
Deposits	900.04
Unmatured interest on funded debt accrued	5,023.60
Unmatured interest on notes and bills payable accrued	451.79
Misc. liabilities accrued	115.44
Surplus	47,035.79
Total increase in liabilities	$856,433.82

Dec. 31, 1906—June 30, 1910.

APPLICATIONS OF THE RECEIPTS.

Increase in Assets:	
Property and plant	$348,477.31
Investments	10,000 00
Notes and bills receivable	3,000.00
Accounts receivable	5,630.70
Interest and dividends receivable	180.00
Material and supplies	17,660.22
Misc. current assets	46.70
Prepaid insurance	319.53
Misc. prepaid accounts	87.50
Bad debts	411.41
Suspense account	18,601.70
Decrease in Liabilities:	
Special funds	2,304.36
Accounts payable	6,904.06
Total	$413,628.49

SOURCES FROM WHICH RECEIPTS WERE OBTAINED.

Increase in Liabilities:	
Notes and bills payable	$378,000 00
Deposits	827.59
Unmatured interest on funded debt accrued	5,023 60
Unmatured interest on notes and bills payable accrued	451.79
Miscellaneous liabilities accrued	115.44
Surplus	26,966.59
Decrease in Assets:	
Cash	2,238.48
Total	$413,623.49

The foregoing statements, together with the balance sheets, are sufficient to bring out the more important changes which have taken place since the consolidation. From these statements it appears that the cost of property and plant has increased $785,980.13 from Feb. 5, 1906, to June 30, 1910. Of this amount $436,465.25 is represented in construction and equipment, and $375,000 is covered by the item "Plant and franchise" ($375,000), shown in the balance sheet for Dec. 31, 1906. This latter amount, we find in the minute book of the company, was voted to Stubbs and others for services in promotion, organization, etc.

The increase in investments amounting to $10,000 is explained by the separation of the South Beloit property from the Beloit Water, Gas and Electric Co. Materials and supplies have increased $20,458.14. The suspense account covers the expenses incurred by the company in the proceedings before the Commission in this case.

Turning to the increases in liabilities, we note where this money was obtained. Capital stock, common, to the amount of $375,000 was issued, which constitutes the sum voted to Stubbs and others for services, etc. Notes and bills payable have increased $405,000, which amount nearly covers the total cost of construction and equipment since consolidation. Special funds increased $13,075.49, accounts payable $9,831.67, and surplus $47,035.79.

The large sums expended for construction and equipment since the consolidation indicate that the company has found it necessary to extend and improve to a considerable extent. The plants have been overhauled and new equipment installed, the electric lines have been reconstructed to a large extent, the gas distribution system has been changed largely from a low pressure to a high pressure system, land has been purchased, and a new gas station and holder erected. Whether the construction account includes items which properly do not belong therein, is a question in regard to which something should perhaps be said.

The income account of the property as a whole is shown in the following table covering the interval from Jan. 1, 1907, to June 30, 1910:

TABLE XXIX.
COMBINED INCOME ACCOUNTS.
AS APPORTIONED TO THE THREE UTILITIES BY THE COMPANY.

	Year ending				
	Dec. 31, [1]1906.	Dec. 31, 1907.	Dec. 31, 1908.	June 30, 1909.	June 30, 1910.
OPERATING REVENUE:					
Water department	$28,381 61	$35,203 71	$37,505 59	$38,492 71	$40,951 10
Gas department	37,303 85	64,122 35	68,814 39	74,774 18	79,450 41
Electric department	32,941 57	42,664 34	48,823 17	54,821 85	61,260 32
Total operating revenue	$98,627 03	$141,990 40	$155,143 15	$168,088 74	$181,661 83
OPERATING EXPENSES:					
Water department	$10,347 36	$14,266 77	$15,028 43	$15,517 42	$17,679 01
Gas department	17,005 04	39,635 49	41,728 39	44,603 11	47,542 06
Electric department	21,074 57	22,675 16	21,805 41	22,750 86	23,164 42
Total of above items	$48,426 97	$76,577 42	78,562 23	$82,871 39	$88,385 49
Taxes	5,353 64	6,203 55	7,640 00	8,700 00	9,050 00
Total operating expenses	$53,780 61	$82,780 97	$86,202 23	$91,571 39	$97,435 49
Net operating revenue	$44,846 42	$59,209 43	$68,940 92	$76,517 35	$84,226 34
Non-operating revenue	2,315 93	[2]*734 54*	[2]*2,291.71*	[2]*1,844 75*	[2]*1,099 35*
Gross income	$47,162 35	$58,474 89	$66,649 21	$74,672 60	$83,126 99
DEDUCTIONS FROM GROSS INCOME:					
Interest on bonds	....	$36,650 00	$36,650 00	$36,650 00	$36,650 00
Interest on floating debt	....	7,879 35	18,830 86	20,166 96	23,693 91
Total deductions	[3]$40,304 35	$44,529 35	$55,480 86	$56,816 96	$60,343 91
Net income available for dividends on stock	$6,858 00	$13,945 54	$11,168 35	$17,855 64	$22,783 08
Per cent on capital stock	....	2.32	1.86	2.97	3.79

[1] Last 10 months.
[2] Deficit.
[3] Includes stock dividends.

The foregoing table has been prepared from statements submitted by the company and from the annual reports to this Commission. Some minor corrections have been found necessary, but these corrections do not materially affect the conclusions to be reached. Total operating revenues have increased steadily with a corresponding increase of net operating revenues. Total deductions from gross income have been increased considerably during the last three years, due to the increase in interest on floating debt or notes and bills payable. These notes represent the amount borrowed for construction and equipment. The amount available for dividends on the capital stock has increased from 2.32 per cent in 1907 to 3.79 per cent for the year ending June 30, 1910.

The schedule of interest payable each year on bonded indebtedness and bills payable is shown in the following statement as of Dec. 1, 1909:

Bonds:		
$150,000 at 6%	$9,000.00	
520,000 at 5%	26,000.00	
30,000 at 5½%	1,650.00	
		$36,650.00
Bills payable:		
$135,000.00—5 yr. coupon note issued to stockholders dated 11—1—06, at 6%	$8,100.00	
175,550.00—Const. note issued 7— 1—08, at 6%	10,553.00	
7,500.00—Const. note issued 7—29—08, at 6%	450.00	
2,500.00—Const. note issued 8—18—08, at 6%	150.00	
4,000.00—Const. note issued 9— 4—08, at 6%	240.00	
8,500.00—Const. note issued 10— 3—08, at 6%	510.00	
7,000.00—Const. note issued 11—10—08, at 6%	420.00	
Total interest payable each year on notes, as of Jan. 1, 1909	$20,403.00	
Notes given after Jan. 1, 1909, as follows:		
$9,000.00—Const. note issued 1— 1—09, at 6%	540.00	
7,000.00—Const. note issued 1—28—09, at 6%	420.00	
3,000.00—Const. note issued 2—26—09, at 6%	180.00	
10,000.00—(Included in const. note for $234,050 issued 7—1—09, canceling all const. notes issued from 7—1—08 to 7—1—09), at 6%	600.00	
17,500.00—Const. note issued 7—29—09, at 6%	1,050.00	
5,000.00—Const. note issued 9—25—09, at 6%	300.00	
Year int. on notes issued since Jan. 1, 1909	$3,090.00	
Total int. payable each year on notes as of Dec. 1, 1909		23,493.00

Preferred stock:	
$100,000.00, int. payable June 30, and Dec. 31, cumulative 6%	6,000.00
Total yearly interest payable, as of Dec. 1, 1909....................	$66,143.00

From the foregoing statement it appears that the interest requirements of the company as of Dec. 1, 1909, on bonds and notes and bills payable amounted to $60,143, or at the average rate of about 5.5 per cent on the total issue.

The distribution of the assets and liabilities, and the earnings and expenses of the utility as a whole as between the three departments, may be noted by the following comparative balance sheets and income accounts. The statements are reproduced largely from the annual reports made to this Commission. Some minor corrections have been made in the statements as reported, but the apportionments have not been disturbed and stand as submitted by the company.

The balance sheets reproduced herein are as of dates Jan. 1, 1908, June 30, 1909, and June 30, 1910. No balance sheets for the separate departments appear to have been made by the company previous to the period when the Commission prescribed uniform classification of accounts for public utilities.

among the three departments. In general the policy appears to have been one of decreasing the capital charges to the water and gas departments and of throwing this burden upon the electric department. In fact, the water department is made to show a deficit by these transactions as made in the balance sheets.

The basis of apportionment of the plant investment between the departments is shown below. Construction and equipment for each year is also shown.

Cost Close of Year—Jan. 1, 1908.		
Water	$629,430.94	40% (approx.)
Gas	550,752.07	35
Electric	393,394.34	25
Total	$1,573,577 35	100.0%
Cost Close of Year—June 30, 1909.		
Water	$572,849.58	34.5% (approx.)
Gas	622,792.11	37.5
Electric	461,560.30	28.0
Total	$1,657,201.99	100.0%
Cost Close of Year—June 30, 1910.		
Water	$482,278.90	28.5% (approx.)
Gas	616,628.57	36.5
Electric	596,321.92	35.0
Total	$1,695,229.39	100.0%

Construction During Year Ending:

	Jan. 1, 1908.		June 30, 1909.		June 30, 1910.		Total.	
	Amount.	Per ct.	Amount.	Per ct.	Amount.	Per ct.	Amount.	Per ct.
Water	$28,420 60	13	$15,482 48	26	$16,685 54	44	$60,588 62	19
Gas	127,547 51	56	12,032 79	20	13,171 35	35	152,751 65	47
Electric	69,709 44	31	32,802 73	54	8,170 51	21	110,682 68	34
Total	$225,677 55	100	$60,318 00	100	$38,027 40	100	$324,022 95	100

NOTE:—Percentages approximate figures.

It appears from the foregoing statements that the apportionment of plant investment between the several departments has varied largely during the past few years. The proportion charged to the water department, for example, has dropped from 40 per cent of the total to 28.5 per cent. The other two departments show increases, the gas 1.5 per cent and the electric 10 per cent. That these changes have not been due entirely to the construction and equipment accounts or additions to property, is clearly seen. About 47 per cent of the entire cost of construction, during the three years shown, has been charged to the gas department, or $152,751.65 out of a total of $324,022.95. The smallest sum has been expended in connection with the water utility. The changes which have been effected are quite clearly evidenced in the apportionments made by the company of the item of investments and capital liabilities, where an increasing charge to the electric utility is noted.

A comparison of the appraised values of the several departments and the staff's and company's estimates of the value of the physical property is shown below, together with a percentage distribution of the same:

COMPARISON OF VALUES (Approximate Percentages).

BASIS.	Water.	Gas.	Electric.	Total.
APPRAISED VALUES.				
Staff:				
Cost of reproduction	$274.110	$301,690	$210.679	$786.479
Per cent of total	*35*	*38*	*27*	*100*
Present value	254,166	280,961	177,720	712.847
Per cent of total	*36*	*39*	*25*	*100*
Company:				
Cost of reproduction	323,926	366.402	260.059	950.387
Per cent of total	*34*	*39*	*27*	*100*
Present value	305.617	338.689	216,972	861,278
Per cent of total	*36*	*39*	*25*	*100*
BOOK VALUES.				
Book value, Jan. 1, 1908	629,430	550.752	393,394	1,573.576
Per cent of total	*40*	*35*	*25*	*100*
Book value, June 30, 1909	572,849	622,792	461.560	1,657.201
Per cent of total	*34.5*	*37.5*	*28*	*100*
Book value, June 30, 1910	482,278	616,628	596,321	1,695,227
Per cent of total	*28.5*	*36.5*	*35.0*	*100*

The values given for the staff and company appraisals are of the date Jan. 1, 1909, and cover only the physical property of the company. The addition of the elements of going value and value of water power as claimed by the company would, of course, affect the proportions. The effect of such additions would be to raise the proportions assigned to the water and electric departments as compared with the gas department. Subsequent additions to the property will affect the percentages but slightly.

DETAILED INCOME ACCOUNTS.

The detailed income accounts for the years ending Dec. 31, 1907, Dec. 31, 1908, June 30, 1909, and June 30, 1910, are shown in the following tables XXXII, XXXIII and XXXIV, as reported by the company, with certain corrections:

TABLE XXXII.

EARNINGS AND EXPENDITURES.

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Water Department.

(As Reported by the Company.)

	Years Ending			
	Dec. 31, '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
OPERATING REVENUES:				
Commercial sales:				
By meter	$459 84	$537 65	$562 49	$638 38
By contract (flat rates)	25,883 08	27,453 42	27,724 13	29,201 85
Total gross commercial	$26,342 92	$27,991 07	$28,286 62	$29,840 23
Deduct adjustments	[1]*506 96*	[1]*516 30*	[1]*544 16*	[1]*421 91*
Total net commercial	$25,835 96	$27,474 77	$27,742 46	$29,418 32
Municipal sales:				
Hydrant rental	9,362 75	9,673 18	9,953 14	10,524 48
Street cleaning	....	....	75 00	75 00
Flush tanks	....	19 84	138 83	237 96
Total municipal	$9,362 75	$9,693 02	$10,166 97	$10,837 44
Miscellaneous earnings from operation	5 00	337 80	205 78	257 84
Total operating revenues	$35,203 71	$37,505 59	$38,492 71	$40,951 10
OPERATING EXPENSES:				
Pumping:				
Superintendence	$507 88	$379 00	$379 00	$536 34
Labor at station	1,870 40	1,840 77	1,370 30	1,862 95
Fuel	4,439 93	2,366 00	1,918 14	2,080 63
Electric current purchased	710 84	3,507 55	4,022 50	4,845 44
Water power	123 22	190 00	230 00	47 50
Misc. pumping supplies and expenses	634 38	446 68	578 00	809 44
Maint. steam power equipment	158 33	53 95	241 77	125 52
Maint. pumping station equipment	320 88	223 78	256 67	292 88
Maint. buildings, fixtures and grounds	63 24	149 65	365 82	731 41
Maint. water wheels	24 87	2 55	2 71	8 50
Total pumping	$8,853 97	$9,159 93	$9,864 91	$11,340 61
Distribution:				
Labor removing and resetting meters	$12 83	$3 46	$11 89	$9 71
Street department labor	91 32	365 42	390 09	338 67
Customers' premises expenses	13 42	17 27	2 10	5 06
Maintenance of mains	78 56	116 23	177 17	173 26
Maintenance of services	147 59	55 58	104 07	560 58
Maintenance of hydrants	182 19	83 70	144 78	96 76
Maintenance of meters	9 94	2 10	3 98	20 85
Deduct water used by company	[1]*169 72*	[1]*136 56*	[1]*157 08*	[1]*163 92*
Total distribution	$366 13	$507 20	$677 00	$1,040 85
Commercial:				
Collection expenses	$12 34	$39 06	$52 43	$98 70
Promotion of business	176 07	90 44	96 58	99 00
Total commercial	$188 41	$129 50	$149 01	$197 70
General:				
Salaries of general officers	$1,601 70	$1,772 76	$1,819 92	$1,891 08
Salaries of general office clerks	1,604 13	1,784 35	1,615 87	1,620 80
General office rent	258 52	232 20	237 60	275 28
Misc. general office supplies and expenses	338 34	275 02	328 03	373 60
Law expenses—general	220 46	258 72	169 37	160 21
Miscellaneous general expenses	676 24	699 94	495 76	491 99
Railroad Commission expenses	....	45 70	....	79 02
Total general	$4,699 39	$5,068 69	$4,666 55	$4,891 98

[1] Debits.

TABLE XXXII—Concluded.

EARNINGS AND EXPENDITURES.

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Water Department.

(As Reported by the Company.)

	YEARS ENDING			
	Dec. 31, '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
Undistributed:				
Insurance	$30 29	$33 84	$91 23	$127 39
Stationery and printing	128 58	129 27	68 72	80 48
Total undistributed	$158 87	$163 11	$159 95	$207 87
Total of above items	$14,266 77	$15,028 43	$15,517 42	$17,679 01
Taxes	2,658 84	3,193 88	3,498 65	3,620 00
Total operating expenses	$16,925 61	$18,222 31	$19,016 07	$21,299 01
Net operating revenue	$18,278 10	$19,283 28	$19,476 64	$19,652 03
Non-operating revenues	....	....	156 00	77 99
Gross income	$18,278 10	$19,283 28	$19,632 64	$19,730 02

TABLE XXXIII.

EARNINGS AND EXPENDITURES.

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Gas Department.

	YEARS ENDING			
	Dec. 31, '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
OPERATING REVENUES:				
Commercial earnings	$48,381 13	$54,476 71	$59,730 72	$64,376 00
Deduct allowances, corrections, etc	[1]*73 41*	[1]*110 52*	[1]*112 06*	[1]*111 26*
Net commercial earnings	$48,307 72	$54,366 19	$59,618 66	$64,264 74
Street lighting earnings	38 18	[1]*18 67*	....	....
Misc. earnings from operation	2,011 26	2,293 96	....	....
Total of above items	$50,357 16	$56,641 48	$59,618 66	$64,264 74
Earnings from residuals (net)	13,765 19	12,172 91	15,155 52	15,185 67
Total operating revenues	$64,122 35	$68,814 39	$74,774 18	$79,450 41
OPERATING EXPENSES:				
Production:				
Coal Gas:				
Superintendence	$1,087 09	$470 08	$552 18	$369 20
Retort-house labor	5,344 35	3,333 71	3,454 98	3,805 28
Purifying labor and expense	171 23	248 29	149 23	113 83
Coal carbonized	16,264 09	13,812 88	16,475 24	16,045 25
Bench fuel	5,794 51	4,200 63	4,286 96	4,349 97
Enricher (oil)	1,074 78	60 00	....	....
Steam	133 70	260 25	361 97	451 24
Misc. coal gas supplies and expenses	550 30	495 20	573 62	588 21
Maintenance of benches	100 62	1,059 64	1,150 00	199 91
Maintenance of coal gas apparatus	399 74	112 68	38 78	181 33
Maint. of coal gas bldgs. and grounds	51 63	209 38	309 07	54 14
Total coal gas	$30,972 04	$24,262 74	$27,350 03	$26,158 36

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[1] Debits.

TABLE XXXIII—Concluded.

EARNINGS AND EXPENDITURES.

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Gas Department.

	YEARS ENDING			
	Dec. 31, '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
OPERATING EXPENSES—Continued.				
Water Gas:				
Superintendence	$20 88	$211 67	$174 16	$199 93
Generator house labor	28 50	633 21	429 53	595 68
Purifying labor and expense	....	32 15	4 58	83 00
Blast motor	....	166 18	223 58	370 46
Steam	14 50	1,016 47	909 14	951 12
Generator fuel	86 70	1,890 53	1,778 91	2,554 09
Enricher (oil)	123 32	2,290 65	1,852 82	2,150 98
Misc. water gas supplies and expenses	48	378 53	394 43	372 47
Maint. water gas apparatus	....	274 18	186 09	231 62
Maint. water gas buildings and grounds	....	55 88	45 12	53 16
Total water gas	$274 38	$6,949 45	$5,998 36	$7,562 51
Total production	$31,246 42	$31,212 19	$33,348 39	$33,720 87
Distribution:				
Superintendence	....	$254 55	$230 36	$201 31
Labor removing and resetting meters	$326 12	946 91	432 91	225 91
Customers' premises expenses	354 82	366 26	344 92	339 13
Holder station expense	[1]*78 00*	838 81	....	....
Pumping gas	....	7 55	1,641 53	2,944 15
Maint. of mains	52 76	112 05	103 18	200 47
Maint. of services	181 40	135 70	119 45	133 98
Maint. of meters	108 65	99 54	678 49	731 84
Maint. of high pressure governors	....	301 07	466 05	385 23
Misc. distribution expenses	....	....	....	....
Deduct gas used by company	[1]*180 77*	[1]*152 52*	[1]*128 84*	[1]*57 21*
Total distribution	$764 98	$2,909 92	$3,888 07	$5,104 81
Municipal Lighting	$69 06	....	....	....
Commercial:				
Collection expenses	$433 24	$575 79	$552 45	$802 66
Promotion of business	905 00	150 26	156 97	263 69
Total commercial	$1,338 24	$726 05	$709 42	$1,066 35
General:				
Salaries of general officers	$2,100 13	$2,423 30	$2,469 96	$2,842 31
Salaries of general office clerks	2,292 51	2,186 84	1,978 69	2,188 86
General office supplies and expenses	649 10	683 72	834 38	1,045 49
Law expenses—general	263 89	363 63	229 50	235 80
Misc. general expenses	578 16	860 13	798 74	760 60
Railroad Commission expenses	....	37 70	....	110 85
Total general	$5,883 79	$6,555 32	$6,311 27	$7,183 91
Undistributed:				
Insurance	$58 78	$119 59	$244 13	$329 08
Stationery, etc	274 22	205 32	101 83	137 04
Total undistributed	$333 00	$324 91	$345 96	$466 12
Total of above items	$39,635 49	$41,728 39	$44,603 11	$47,542 08
Taxes	2,081 91	2,511 43	2,851 40	2,986 50
Total operating expenses	$41,717 40	$44,239 82	$47,454 51	$50,528 56
Net operating revenue	$22,404 95	$24,574 57	$27,319 67	$28,921 85
Non-operating revenues	....	....	[1]*1,041 50*	[1]*612 44*
Gross income	$22,404 95	$24,574 57	$26,278 17	$28,309 41

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[1] Debits.

TABLE XXXIV.

EARNINGS AND EXPENDITURES,

BELOIT WATER, GAS AND ELECTRIC COMPANY.

Electric Department.

	YEAR ENDING			
	Dec. 31, '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
OPERATING REVENUES:				
Commercial lighting earnings	$25,927 79	$32,339 79	$36,031 33	$38,678 55
Municipal lighting earnings	6,679 50	7,743 38	7,881 51	8,029 86
Commercial power earnings	9,548 23	8,197 88	10,328 10	13.755 36
Misc. earnings from operation	877 37	973 16	1.015 39	1.035 12
Less allowances, corrections, etc.	[1]368 55	[1]431 04	[1]434 38	[1]238 57
Total operating revenues.	$42,664 34	$48,823 17	$54.821 85	$61.260 32
OPERATING EXPENSES:				
Power:				
Superintendence	$591 25	$435 00	$435 00	$568 58
Engine labor	1,761 80	2,055 76	2,133 13	2,071 60
Boiler room labor	1,807 12	1,701 07	1,698 90	2,112 59
Fuel	7,728 89	8,840 64	9,582 42	10,321 83
Water power	648 90	197 05	370 00	227 00
Lubricants	....	308 81	328 43	240 34
Misc. power plant supplies and expenses	1,630 47	1,272 63	1,076 34	1.102 49
Maint. steam plant	371 04	453 75	532 79	846 10
Maint. electric plant	106 99	133 24	232 06	94 59
Maint. water power plant	13 42	149 33	289 19	358 96
Current purchased	....	....	136 15	....
Maint. bldgs. and grounds at station	40 14	38 98	249 30	29 23
Total power	$14,700 02	$15,586 26	$17,063 71	$17,973 31
Distribution:				
Superintendence	$724 55	$810 00	$810 00	$656 62
Labor removing and resetting meters	211 82	237 64	190 45	116 18
Maint. distribution system	253 82	306 50	269 21	275 65
Maint. motor-generators	....	26 47	94 45	68 16
Maintenance of meters	45 51	236 66	403 86	494 47
Deduct electricity used by company	[1]$1,632 64	[1]$4,662 53	[1]$5,314 28	[1]$6,360 70
Total distribution	[1]$396 94	[1]$3,045 26	[1]$3,546 31	[1]$4,749 62
Consumption:				
Commercial lamp supplies	....	....	$26 27	$29 31
Incandescent lamp renewals	$111 92	679 69	933 61	862 64
Sign and window lighting expenses	56 09	188 56	164 67	170 27
Customers' premises expenses	291 69	417 30	400 35	360 44
Maint. commercial lamps	243 52	79 86	104 12	49 55
Trimming and inspecting arcs	250 48	226 83	309 63	351 88
Municipal lighting supplies and expenses	333 09	556 01	....	....
Maint. of municipal contract lamps	65 51	13 58	486 52	555 63
Total consumption	$1,352 30	$2,161 83	$2,425 17	$2,379 72
Commercial:				
Collection expenses	$288 48	$375 34	$357 94	$402 74
Promotion of business	553 48	132 47	130 21	145 37
Total commercial	$841 96	$507 81	$488 15	$548 11
General:				
Salaries of general officers				
Salaries general office clerks	$1,899 82	$2,153 87	$2,210 04	$2,466 60
General office rent	2,031 02	1,953 16	1,810 49	1,893 94
General office supplies and expenses	284 16	283 80	290 40	362 72
Law expenses-general	440 27	364 09	470 64	547 16
Misc. general expenses	232 94	314 76	205 43	208 49
Railroad Commission expenses	512 48	742 63	570 98	698 83
	....	....	....	95 39
Total general	$5,400 69	$5,812 31	$5,557 98	$6,273 13

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[1] Debits.

TABLE XXXIV—Concluded.
EARNINGS AND EXPENDITURES.
BELOIT WATER, GAS AND ELECTRIC COMPANY.
Electric Department.

	YEAR ENDING			
	Dec. 31. '07.	Dec. 31, '08.	June 30, '09.	June 30, '10.
Undistributed:				
Insurance	$547 07	$741 57	$678 21	$624 64
Stationery, etc	230 06	140 89	83 95	115 13
Total undistributed	$777 13	$882 46	$762 16	$739 77
Total above items	$22,675 16	$21,805 41	$22,750 86	$23,164 42
Taxes	1,462 80	1,934 69	2,349 95	2,443 50
Total operating expenses	$24,137 96	$23,840 10	$25,100 81	$25,607 92
Net operating revenue	$18.526 38	$24,983 07	$29,721 04	$35,652 40
Non-operating revenues	....	....	[1]*959 25*	[1]*564 90*
Gross income	$18,526 38	$24,983 07	$28,761 79	$35,087 50

[1] Debits.

The increases in revenues and expenses for the three departments are summarized below:

Total operating revenues—increase.

Water	$5,747.39	14.5%
Gas	15,328.06	38.5
Electric	18,595.98	48.0
Total	$39,671.43	100.0%

The largest increase in revenues is found in the electric department with the water department showing the smallest growth.

Total operating expenses—increase.

Water	$4,373.40	30.0%
Gas	8,811.16	60.0
Electric	1,469.96	10.0
Total	$14,654.50	100.0%

While the total operating revenue of the electric department shows the largest increase, the expenses show the smallest increase. The figures above given indicate either more efficient operation of the department, largely increased business, or may, in part at least, be due to apportionments between the departments which throw too great a burden upon the water and gas departments. An analysis of the various expense items should be made to determine upon what bases the company has apportioned those expenses which are common to the several departments.

The following table shows the total direct expenses of the three departments for each year, together with the percentage relations to the total of all departments. Direct expenses include all expenses up to and including commercial expenses, but do not include general and undistributed expenses.

TABLE XXXV.

TOTAL DIRECT EXPENSES.

DEPARTMENT.	YEAR ENDING							
	Dec. 31, 1907.		Dec. 31, 1908.		June 30, 1909.		June 30, 1910.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
Water	$9,408 51	15.86	$9,796 63	16.39	$10,690 92	$16.43	$12,579 16	17.56
Gas	33,418 70	56.33	34,848 16	58.32	37,945 88	58.32	42,878 53	59.88
Electric	16,497 34	27.81	15,110 64	25.29	16,430 72	25.25	16,151 52	22.56
Total	$59,324 55	100.00	$59,755 43	100.00	$65,067 52	100.00	$71,609 21	100.00

Company's Distribution of General and Undistributed Expenses.

DEPARTMENT.	Dec. 31, 1907. Amount.	Per cent.	Dec. 31, 1908. Amount.	Per cent.	June 30, 1909. Amount.	Per cent.	June 30, 1910. Amount.	Per cent.
Water	$4,858 26	28.2	$5,231 80	27.8	$4,826 50	27.2	$5,099 85	25.8
Gas	6,216 79	36.0	6,880 23	36.6	6,657 23	37.3	7,650 03	38.7
Electric	6,177 82	35.8	6,694 77	35.6	6,320 14	35.5	7,012 90	35.5
Total	$17,252 87	100 0	$18,806 80	100.0	$17,803 87	100.0	$19,762 78	100.0

It is at once apparent from the foregoing statement that the company has not apportioned the general and undistributed or overhead charges between the three departments on the basis of the total direct expenses. The effect of the basis adopted by the company appears to have shifted the burden of the overhead expenses from the gas department to the water and electric departments. The water department especially appears to have been discriminated against in this respect.

It will be noted that the total distribution expenses of the electric department appear as a debit item each year. This may be explained by the method adopted by the company in crediting the electric department with the current supplied to the water department to operate a motor driven pump. The item of "Electric current purchased" appearing under "Pumping expenses" in the water department represents the charge for current used by the pump motor as determined by the company.

This amount is smaller each year than the deductions which appear under "Distribution expenses" in the electric department. The difference represents the charge for the current used by the company in the electric department. This explanation is given in the following statement:

	YEAR ENDING			
	Dec. 31, '07	Dec. 31, '08	June 30, '09	June 30, '10
Deduct "Electricity used by Co"	$1,632 64	$4,662 53	$5,314 28	$6,360 70
"Electric current purchased"	710 84	3,507 55	4,022 50	4,845 44
Correct deduction for "Electricity used by Co." (elec. dept.)	$921 80	$1,154 98	$1,291 78	$1,515 26

For the year ending June 30, 1910, the company reports the consumption of current by the pump motor as 242,272 kw. hrs. It is also reported that the water department is charged for this current on a basis of 2 cts. per kw. hr. Whether or not this charge is reasonable, cannot be closely determined at this point. An analysis of the electric generation expenses and an apportionment of these expenses between the several branches of service rendered by the department will be made later, and the cost of the energy supplied to the water department for pumping purposes will be determined. Whatever change such analysis will effect, if any, will probably be of such a small amount relatively as to be practically negligible as regards its effect on the relation of the total direct expenses of the three departments, although such a difference as found may be of considerable importance in dealing with the generation expenses alone.

A large portion of the total wages and salaries of employes is common to two or three departments. A proper distribution of these costs must be based largely upon time slips or other forms of record which will show the time given by each employe to different branches of the service. Again, it is appreciated that some of the superintendence and labor must be apportioned on a more or less arbitrary basis. A careful analysis of the labor costs of the company and the separation of these costs made by the company between the departments, indicates that while the separations are not in all cases founded upon as reasonable a basis as they perhaps should be, that, as a whole, however, the results obtained are not far out of line.

GOING VALUE.

Respondent claims a total going value of the three utilities of the sum of $173,730, which is divided between the departments as follows:

Water department	$63,996
Gas department	63,261
Electric department	46,473
Total	$173,730

The above amounts claimed by the respondent as measuring the going value of the utility are as determined by Mr. Benezette Williams, principal witness for the company on this question.

The Commission has quoted freely from the testimony and opinions of engineers, appraisers, and the courts, in previous decisions, and has recognized the element of going value as one which is properly considered in determining the value of a utility upon which the reasonable return must be computed.

The methods used by Mr. Williams in this case, and which are supported by the testimony of other witnesses of the respondent, are essentially the same as have been described by the Commission in earlier decisions.

Beginning his report, Mr. Williams states as follows:

> "All utilities that are distinctly public ones have a continuing existence. The acquired revenue of such utilities is also continuing and is the basis of an element of value which augments the physical value. This element is the 'going value,' or the potential business value, the amount of which must be determined by the net income which a plant in operation will have in excess of what a substitute plant of like character, the construction of which is begun at the time of valuation, can produce, the annual excess earnings being reduced to present worth."

The last sentence above quoted discloses the method of computation adopted by Mr. Williams in arriving at the going value of the Beloit plants.

Mr. Williams plots two curves showing the growth of the earnings and expenses of the water plant since the date operations were begun up to the year 1909. These curves are then projected to 1920, at which time it is judged that a substitute plant put into operation July 1, 1910, could gain a revenue equal to what the present plant will have that time. The estimated period of construction of the new or substitute plant is taken as one to one and one-half years. Capitalizing the estimated losses sustained by the substitute plant during the years required to reach a total revenue equal to the estimated total revenue of the present plant, measures the going value of the present plant. In other words, the annual excess earnings of the present plant over the substitute plant are reduced to present worth. This roughly describes the method of computing the going value of the water, gas and electric departments of the company as adopted and used by Mr. Williams. By the use of this method Mr. Williams obtains what is termed the "going value" of the plants, or, more properly speaking, their value as a "going concern."

The Commission has previously stated that

> "The connected load or business is, of course, of value, but it appears to us that this value is covered by the cost of establishing the connections and acquiring the business, which costs, in one form or another, have found their way into the accounts of the company, and therefore constitute a part of the facts that are taken into consideration in appraising the plants. * * * Possible future growth of the business can hardly be legitimately capitalized by utilities which are not entitled to more than reasonable returns on their investment; and this is also true of the rights to do business in a particular city, which rights have been granted free of cost." *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 578.

It has been held that the costs of developing the business of a public utility is as much a part of the investment in the business as the physical structure.

> "For public utilities which, under both the common and the statute law, under normal conditions are only entitled to reasonable returns on the investment, justice as well as equity appears to demand that the amounts, if any, by which they, under ordinary conditions, have failed to earn such returns, should be considered in fixing values and rates for such plants." *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 585.

The early losses or deficits, or the amounts by which the earnings of the plant have failed to meet the ordinary operating expenses and taxes, and provide for depreciation and a reasonable return on the investment, will closely measure, in most cases, the cost of developing the business. This method of determining the cost of developing the business has been described in detail in previous decisions. The Commission has stated in this connection that,

> "By this is not meant, however, that deficits from operation can be equitably taken into account in the appraisals or rates regardless of the conditions under which they were incurred. As already stated, when such deficits are due to abnormal conditions, or when due to bad management, defective judgment, extravagance, lack of ordinary care and foresight, unduly high capital charges, and other causes of this nature, it is manifestly clear that they should be accorded little or no consideration in either the valuation or the rates" (pp. 585, 586).

And further it was held that

> "This is also likely to be the case for such deficits which were incurred under and borne by others than the present owners, and which have been wiped out in the various transfers of ownership. That these propositions are, as a rule, sound and equitable, appears to be so clear as to need no further argument" (p. 586).

In the case before us herein, the transfer of the three utilities to the present ownership or consolidation has been comparatively recently effected. But little reliable information is available as regards the accounts of the plants before the consolidation and transfer of the properties. Especially is this true of the water utility. The operations of the plants subsequent to the transfer have, however, been quite clearly revealed in the detailed income accounts, balance sheets, construction and equipment accounts and other records.

The following table XXXVI presents an approximate statement of the value of the respondent's physical property as of date June 30, 1910. Certain corrections have been made, as previously noted in the discussion of the physical property. Paving not actually cut through and replaced has been deducted, and the additions to property since Jan. 1, 1909, have been added. It will be noted that the above additions to property have been considered as having suffered no depreciation and have been added to both the cost new and to the existing value. While this assumption is not strictly in accord with the facts, it is believed that the error in the total existing value caused by this assumption is slight in amount and practically negligible in its effect upon the results.

TABLE XXXVI.

TENTATIVE VALUATION OF PHYSICAL PROPERTY

as of June 30, 1910, after Adjustments and Corrections.

CLASSIFICATION.	Water.		Gas.		Electric.		Total.	
	New.	Existing.	New.	Existing.	New.	Existing.	New.	Existing.
1. Land	$14,822	$14,822	$10,239	$10,239	$7,028	$7,028	$32,089	$32,089
2. Wells and suctions	14,780	14,423	....	....	....	....	14,780	14,423
3. Reserv., water tanks, hold	14,981	14,066	42,223	40,595	....	....	57,204	54,661
4. Dist. system	159,148	154,229	103,061	96,801	74,810	67,049	337,019	318,079
5. Power plant equipment	20,094	15,105	56,854	52,505	72,901	62,151	149,849	129,761
6. Bldgs. and misc. structures	17,975	14,617	31,293	27,134	35,956	22,456	85,224	64,207
7. Office furn. and appliances	979	783	979	783	979	783	2,937	2,349
8. Tools and instruments	931	475	1,627	887	1,464	878	4,022	2,240
9. Horses, wagons and misc	141	98	843	705	141	98	1,125	901
Total items 1-9	$243,851	$228,618	$247,119	$229,649	$193,279	$160,443	$684,249	$618,710
10. Add 12%*	29,262	27,434	29,654	27,558	23,194	19,253	82,110	74,245
Total items 1-10	$273 113	$256,052	$276,773	$257,207	$216,473	$179,696	$766,359	$692,955
11. Stores and supplies	4,170	4,117	13,347	13,282	10,636	10,189	28,153	27,588
Total items 1-11	$277,283	$260,169	$290,120	$270,489	$227,109	$189,885	$794,512	$720,543
12. Paving	540	540	1,978	1,978	....	....	2,518	2,518
Total items 1-12	$277,823	$260,709	$292 098	$272,467	$227,109	$189,885	$797,030	$723,061
13. Non-operating property	8,869	7,563	9,123	7,983	7,349	5,462	25,341	21,008
Total items 1-13	$286,692	$268,272	$301,221	$280,450	$234,458	$195,347	$822,371	$744,069
Additions Jan. 1, 1909-Jan. 30, 1910	21,249	21,249	20,159	20,159	30,425	30,425	71,833	71,833
Grand total	$307,941	$289,521	$321,380	$300,609	$264,883	$225,772	$894,204	$815,902

*For engineering and superintendence, interest during construction, contingencies, etc.

TABLE XXXVII.

EARNING VALUE—WATER, GAS AND ELECTRIC DEPARTMENTS

and of the Utility as a Whole.

	Period.	Value of plant first of year.	Additions during year.	Depreciation.	Interest and profit.	Net receipts for year.	Value of plant end of year.	Average value for year.
				1%				
Water	1906	$230,267	$10,866	$2,357	$16.499	$17,282	$242,707	$235.700
	1907	242,707	28,570	2,554	17,989	18,033	273,787	256,992
	1908	273,787	16.989	2,782	19,760	18,519	294,799	282,281
	*1909	294,799	4.563	1,445	10,398	10,145	301,060	297.080
	1910	301,060	16.686	2,986	21,658	19,730	322.660	309,403
				2%				
Gas	1906	$137,374	$2,494	$2,772	$9,703	$20,352	$131,991	$138,621
	1907	131,991	128,190	4,079	13,726	22,160	255,826	196,066
	1908	255,826	33,163	5,693	19.068	23,811	289,939	272,407
	*1909	289,939	6.988	3,047	10,270	13,640	296,604	293,433
	1910	296,604	13,171	6,296	21,223	28,309	308,985	303,189
				5%				
Electric	1906	$106,610	$33,392	$6,165	$8,631	$11,829	$142,969	$123,306
	1907	142,969	70,065	8,752	12,460	18,281	205,965	178,001
	1908	205,965	24,390	11,113	15,271	24.218	232,521	218,160
	*1909	232,521	22,255	6,139	8,527	15,731	253.711	243,648
	1910	253.711	8,170	13,040	18,046	35,068	257,879	257.796
				2.35%				
Utility as a Whole	1906	$474.251	$46,752	$11,694	$34,834	$49,464	$518,067	$497,627
	1907	518,067	226,825	14,909	44,204	58,475	745,530	631,479
	1908	745,530	74,543	18,450	54,796	66,549	828,769	782,801
	*1909	828,769	33,806	9,861	29,528	39,517	860,447	843,672
	1910	860,447	38,027	20,567	61,562	83,127	897,476	879,460

* For 6 months—Jan. 1 to June 30.

In the foregoing table XXXVII some computations have been made in order to show the relations between the earning value and physical property value of the plants since respondent took control of the property. Beginning with the cost of reproduction or cost new of the physical property of June 30, 1910, the additions during each period have been subtracted back to the early part of 1906, when the consolidation was made. Beginning at that date with the value of physical property thus obtained, computations have been made for each department as shown in the table.

It will be noted that the value of the physical property on the date of the transfer, as obtained by subtracting the additions from the staff's cost of reproduction of date June 30, 1910, is as follows:

Water department	$230,267
Gas department	137,374
Electric department	106,610
Total	$474,251

Depreciation has been computed on the average value of the physical property for each period considered. The rates used are shown in the table. The rate of depreciation used for the utility as a whole is a composite rate determined by the application of the rates for the three departments as given. Interest and profit is computed on the average earning value for each period as shown in the last column of the table. The periods given are as follows:

1906—Last ten months
1907—Calendar year
1908— " "
1909—First six months
1910—Year ending June 30, 1910.

Reference to table XXXVI, showing the adjusted tentative valuation, will show that the earning value on June 30, 1910, as above computed in all departments exceeds the present value of the physical property as of the same date. The relations are as follows:

	Earning value.	Present value.	Difference.
Water department	$322,660	$289,521	$33,139
Gas department	308,985	300,609	8,376
Electric department	257,879	225,772	32,107

In the case of the water department the earning value exceeds somewhat the cost new on June 30, 1910. In the other two departments the earning value appears to fall below the cost new.

Respondent has not established a depreciation reserve and has never set aside or made provision for a depreciation fund. If proper reserves had been created for this purpose, respondent would probably have accumulated by June 30, 1910, the sum of about $12,124 in the water department, $21,881 in the gas department, and about $45,209 in the electric department, or a total reserve of about $80,000, or very close to the excess of the earning value over the present value on the same date as computed in the preceding table.

GENERAL EXPENSES.

Some criticism was expressed by the city in regard to the general expenses of the company. This class of expenses embraces such items as salaries of general officers, salaries of general office clerks, general office rent, general office supplies and expenses, miscellaneous general expenses, etc. Attention is called by the city specifically to the items of executive salaries, clerical salaries, executive and traveling expenses. In fact, the city claimed that material reductions could be made in these items without impairing to any degree the general efficiency of the several departments and of the plant as a whole.

The following table shows the general expenses of the company in detail during four yearly periods, and also shows the apportionment of these expenses between the three departments, as made by the company:

TABLE XXXVIII.

GENERAL EXPENSES.

	Water.	Gas.	Electric.	Total.
Salaries of general officers:				
Year ending Dec. 31, 1907	$1.601 70	$2,100 13	$1,899 82	$5,601 65
" " Dec. 31, 1908	1,772 76	2.423 30	2,153 87	6,349 93
" " June 30, 1909	1,819 92	2,469 96	2,210 04	6,499 92
" " June 30, 1910	1,891 08	2,842 31	2,466 60	7,199 99
Salaries of general office clerks:				
Year ending Dec. 31, 1907	1,604 13	2,292 51	2,031 02	5.927 66
" " Dec. 31, 1908	1,784 35	2.186 84	1,953 16	5,924 35
" " June 30, 1909	1,615 87	1.978 69	1,810 49	5,405 05
" " June 30, 1910	1,620 80	2,188 86	1,893 94	5,703 60
General office supplies, expenses and rent:				
Year ending Dec. 31, 1907	596 86	649 10	724 43	1.970 39
" " Dec. 31, 1908	507 22	683 72	647 89	1,838 83
" " June 30, 1909	565 63	834 38	761 04	2,161 05
" " June 30, 1910	648 88	1.045 49	909 88	2,604 25
Law expenses—general:				
Year ending Dec. 31, 1907	220 46	263 89	232 94	717 29
" " Dec. 31, 1908	258 72	363 63	314 76	937 11
" " June 30, 1909	169 37	229 50	205 43	604 30
" " June 30, 1910	160 21	235 80	208 49	604 50
Miscellaneous general expenses:				
Year ending Dec. 31, 1907	676 24	578 16	512 48	1,766 88
" " Dec. 31, 1908	745 64	897 83	742 63	2,386 10
" " June 30, 1909	495 76	798 74	570 98	1,865 48
" " June 30, 1910	571 01	871 45	794 22	2,236 68
Total general expenses:				
Year ending Dec. 31, 1907	4,699 39	5,883 79	5,400 69	15.983 87
" " Dec. 31, 1908	5,068 69	6,555 32	5,812 31	17,436 32
" " June 30, 1909	4,666 55	6,311 27	5,557 98	16,535 80
" " June 30, 1910	4,891 98	7,183 91	6,273 13	18,349 02

The foregoing table presents the general expenses in detail for four yearly periods and enables a direct comparison of the expenses of the three departments and for the four years covered. The following table shows some of the relationships between the general expenses and the total operating expenses of the plant, not including taxes, depreciation or interest:

TABLE XXXIX

RATIO OF GENERAL EXPENSES TO TOTAL OPERATING EXPENSES.

NOT INCLUDING TAXES, DEPRECIATION AND INTEREST.

Year ending	Water.	Gas	Electric	Total
	%	%	%	%
Dec. 31, 1907	33.7	14.8	23.8	20.8
Dec. 31, 1908	33.8	15.7	26.6	22.2
June 30, 1909	30.1	14.1	24.4	20.0
June 30, 1910	27.7	15.1	27.1	20.7
Average	31.3	14.9	25.5	20.9

It is noted that while the rates of total general expenses (all three departments) to total operating expenses (all three departments) not including taxes, depreciation and interest, has averaged about 20.9 per cent, that at the same time the same ratio for the water department has been about 31.3 per cent, for the gas department 14.9 per cent, and for the electric department 25.5 per cent. These discrepancies may be due, to a large extent, to the basis of apportionment between the three departments. This is a matter which has been discussed previously. In order to throw some light on the matter of general expenses, there has been prepared a table showing the ratios for a number of utilities in the state, both single and combined plants:

TABLE XL.

GENERAL EXPENSES—PER CENT OF TOTAL EXPENSES.

NOT INCLUDING TAXES, DEPRECIATION AND INTEREST.

Water Utilities.		Electric Utilities.		Gas Utilities.	
City.	Per cent.	City.	Per cent.	City.	Per cent.
Appleton	43.8	Appleton	16.5	Appleton	11.8
Ashland	32.4	Ashland	18.8	Ashland	20.9
Chippewa Falls	14.3	Chippewa Falls	11.0	Chippewa Falls	6.3
Eau Claire	14.9	Eau Claire	29.5	Eau Claire	15.1
Fond du Lac	22.6	Fond du Lac	14.2	Fond du Lac	9.7
Green Bay	23.1	Green Bay	10.3	Green Bay	7.1
Janesville	52.9	Janesville	19.0	Janesville	1.8
Kenosha	4.7	Kenosha	10.9	Kenosha	11.6
La Crosse	1.8	La Crosse	8.3	La Crosse	7.2
Madison	12.6	Madison	13.8	Madison	17.3
Marinette	30.6	Manitowoc	11.4	Manitowoc	8.8
Milwaukee	2.3	Marinette	14.3	Marinette	6.3
Oshkosh	28.9	Oshkosh	12.7	Milwaukee	6.1
Racine	47.9	Sheboygan	14.4	Oshkosh	9.9
Sheboygan	27.5	Superior	9.3	Racine	7.1
Superior	13.0	Watertown	10.5	Sheboygan	14.1
Watertown	19.2	Wausau	36.8	Superior	8.4
Wausau	7.2			Watertown	8.8
				Wausau	21.1

Some of the utilities above listed are combined plants, while others are operating but one utility in the city. Perhaps a fairer comparison is afforded by the following table, which includes only those companies operating two or more utilities in the same city:

TABLE XLI.

RATIO OF GENERAL EXPENSE TO TOTAL OPERATING EXPENSES—COMBINED PLANTS IN WISCONSIN.

City.	Company.	Ratios. Per cent.
Milwaukee	T. M. E. R. & L. Co	7.8
Milwaukee	M. L. H. & T. Co	8.7
Ashland	A. L. P. & St. Ry. Co	19.4
Eau Claire	C. V. Ry. L. & P. Co	15.2
Sheboygan	S. L. P. & Ry. Co.	10.1
Appleton	Wis. T. L. H. & P. Co	12.7
Fond du Lac	E. Wis. Ry. & P. Co	11.5
Green Bay	G. B. G. & E. Co	8.4
Kenosha	K. G. & E. Co	16.8
La Crosse	L. C. G. & E. Co	7.9
Madison	M. G. & E. Co	15.3
Marinette	M. & M. L. & T. Co	11.2
Oshkosh	O. G. Light Co	11.6
Superior	S. W. L. & P. Co	9.9
Watertown	W. G. & E. Co	9.5
Wausau	W. St. Ry. Co	22.5
Chippewa Falls	C. F. W. G. L. Co	10.4
Average		12.3
Minimum		7.8
Maximum		22.5

As against an average ratio of 12.3 per cent for the 17 combined plants listed above, the Beloit Water, Gas and Electric Company shows a ratio of about 21 per cent, this percentage being exceeded by one plant among those listed. About two-thirds of the total general expenses of the company is made up of salaries of general officers and general office clerks, and the salaries of general officers alone represent about 40 per cent of the total.

It is expected, and is quite generally found to be the fact, that in combined plants of this kind the rates of general expenses or management costs will be less than in the case of single utilities or plants operating a water, gas, electric, or electric railway property alone. A combination of utilities, such as this case presents, may offer many opportunities for economies not possible in a single utility. Where such economies are made possible, it would appear that while the public is entitled to some share in such benefits as may result from such economies, at the same time the company is entitled to a reward for effecting the results described. In view of the facts and by comparisons with the expenses of similar companies, it appears, however, that the general expenses in this case are, as a whole, perhaps, rather high, and while it is difficult to state exactly what reductions should be made, if it is found that such reductions are called for; nevertheless there are facts which should be borne in mind in determining the return to be allowed on the investment in this case. Other facts tend to show that the distribution of the general expenses over the three departments is not what it should be, and it appears that certain departments are being charged with more than their proper share of the total. This appears practicularly true as regards the water department.

COMMISSION EXPENSES.

The respondent claims that up to June 30, 1910, its expenses growing out of these proceedings and due to the Commission's requirements have amounted to some $23,601.70. Of this amount $18,601.70 appears in the balance sheet of June 30, 1910, of the plant as a whole, as a suspense account, the company having thus carried the major portion of these expenditures until the result of the proceedings would indicate where the burden of these expenses should be thrown. The company has divided this expense about equally between the three departments.

These expenses, which are termed Commission expenses, consist of legal expenses, the cost of expert witnesses, traveling and other expenses of officers of the company and others to and from the hearings, clerical salaries, miscellaneous supplies and expenses, and a proportion of the wages of regular employes of the company who were used in connection with the work for these proceedings. The company went to a considerable expense in preparing a detailed inventory and valuation of its property, expert witnesses were called in regard to the valuation of the water power and for many other questions, the company has also been called upon by the Commission to submit data which with time and care only could be properly done. These and other items have helped to bring the total expense of the proceedings to the sum noted.

"That many expense items of this kind are of such character that they should be taken into account in the readjustment of the expenses for the purpose of this case, would seem to be fairly clear. At the same time it is also true that these costs require the same scrutiny as many other costs. The operating expenses in all such cases as the one now before us should include all legitimate and necessary outlays for the operation and the carrying on of the business of the plant, but no more than this. Furthermore, proceedings of the kind we are now dealing with are not of annual occurrence. In view of this fact it also seems that the greater part of the Commission expenses included above should, for the purposes of this investigation, be distributed over more than one year. In fact, it would hardly be just to the consumers to include all such items in the costs upon which the rates for an indeterminate period in the future are based." *State Journal Printing Co. v. Madison Gas & El. Co.* 4 W. R. C. R. 501, 653.

These remarks apply with equal force to the case before us now.

Investigation of the expenses incurred in these proceedings have caused some reduction in the total reported by the company for the purposes of this case. This fact, together with the fact that the expenses should be distributed over a period of years in order that the rates shall be based upon what shall approach more closely to the normal cost of service, has made an addition of about $800 to the yearly operating expense of each utility or department appear fair to both sides of the case.

NORMAL OPERATING COSTS.

Rates for the services rendered by public utilities should very largely be based upon the cost to the plants of furnishing the services. Cost of service is not the only element upon which reasonable rates depend, but in most cases it is the most important element.

Cost of service includes not only the ordinary expenses of operation of the plant, but also includes the items of taxes, depreciation, and interest and profit on investment. Since rates must be controlled largely by the cost and several of the principal elements of cost are immediately affected and determined by the investment, it is at once apparent that the determination of reasonable rates is largely a matter of investigation of the operating expenses and the investment.

The amount of the investment may be more or less readily and accurately determined by inventory and appraisal of the physical property and careful consideration of the several items of intangible value. The items of depreciation and return on investment are also subject to quite definite determination in view of the known conditions surrounding the business in question. The records of the plant, if properly and correctly preserved, will reveal the actual expenses of operation, including taxes.

The discovery of the actual cost of service, as enumerated above, for a single year or for several years, does not, however, measure the entire field of investigation or denote all of the facts essential to a determination of reasonable rates. Reasonable rates can only be based upon normal and reasonable cost of service, which means that the operating expenses and the investment should be normal and not excessive, in view of the conditions under which the utility must be operated.

Operating expenses will vary from year to year. Contingencies arise which may burden a single year with unusual expenses. Accounts may be so kept as to throw more than its proper share of expense on one year or period. Repairs and purchases of supplies may be deferred from year to year until a particularly heavy burden is accumulated and these unusual costs must be met by one year's earnings. These and numerous other factors may influence the cost of service for the year or other period selected for analysis and only careful investigation of the operation of the plant will reveal what are the normal operating expenses upon which the determination of reasonable rates shall be based. Merely averaging the total expenses for a number of years will not suffice. The details must be analyzed and items such as fuel, labor and repairs, must be studied separately. Unit costs should be computed and the relations between the expenses and the growth of the business should be analyzed by means of tables and diagrams showing the changes from year to year. Comparisons with the costs and statistics of operation of similar plants would appear to be essential to a complete study of the situation.

What is true in regard to operating expenses seems to be true, in a large measure, as regards investment. Theoretically the total investment should increase in a line parallel to the increase in connected load, business or number of consumers. In practice this does not appear to be true. Plants are constructed and additions to property and extensions made in advance of the growth of the connected business. To illustrate, it may be said that while the business will increase quite generally in a more or less uniformly smooth line, the investment line par-takes quite generally of the appearance of a series of steps. The plant is originally built with no connected business and a large investment appears in a period of a year or two. The investment line then, while rising rapidly in a short period, will then remain in a more or less horizontal position for a more prolonged period. A number of years may be passed before the growth of business line reaches and crosses the investment line and may continue diverging from and rising above the latter until the plant and system becomes so heavily loaded as to require additional capacity to successfully meet the increasing demands of the business and render adequate service. The placing of additional or larger equipment to meet this demand will then cause the investment line to rise suddenly, and perhaps cross, and rise to a point considerably above the business line, where it again assumes a horizontal position and remains thus until the business line again intersects it and passes above it. Such a history would appear to be quite generally the experience of the smaller utilities especially.

Again, where new management has taken charge of a plant, or where consolidations have been effected, as is true in the case involved herein, the new owners make a serious effort to increase the business and find it necessary to make large outlays to put the property in shape to furnish adequate service and meet the increased business sought. The respondent expended a considerable amount of money in this manner within the few years immediately following the consolidation.

It is at once apparent from these facts and illustrations that careful inquiries should be directed to determine the relation between the investment line and the growth of business line at the particular period or year upon which the determination of the cost of service and, therefore, the rates are to be determined. For it is evident from these considerations that if the rates are computed upon the return on an investment which is taken at a point where the investment line is considerably above the business line, that, what appear to be reasonable rates at that point, may prove to be unreasonable and excessive at a point several years further on. Or, on the other hand, what may appear to be reasonable rates when the investment line has fallen below the business line, may prove to be much lower than sufficient to produce a revenue which will give a reasonable return on the investment a year or a few years later when the investment will have to be materially increased in order to meet the demands of the business.

That these appear to be facts which are worthy of careful consideration in connection with such problems as those before us herein, would seem to be clear. At least they are indicative of the importance of the determination or normal operating costs of service in problems of rate making. Consideration of these factors in their relation to the three departments of respondent's property must be deferred, however, to the discussion of the separate utilities, which will be taken up later herein.

WATER UTILITY.

ADEQUACY.

There appears to be no question as regards the adequacy of the water supply itself. The wells of respondent's water utility appear to be ample to meet all present demands as far as the quantity of water is concerned. Metering of all or a large portion of the services in Beloit will tend to increase the adequacy of the present source of supply.

The following memorandum submitted by the engineering staff of the Commission covers the adequacy of the wells and storage facilities as well as the fire protection service:

Beloit Water Works Test.

"A test of the water works of the Beloit Water, Gas and Electric Company was conducted by the company and the municipal authorities of Beloit on Feb. 27, 1909, in the presence of Professor W. D. Pence, engineer, and the following members of the engineering staff: Professors J. G. D. Mack and H. J. Thorkelson, Messrs. Freeman, Vosskuehler, Sloan, Hatch, De Boos and Miller.

"The test was witnessed by the Commission's engineer at the special request of the city authorities of Beloit, who had advised of their intention to call for a test by turning in a fire alarm without previous notice to the company. Saturday, Feb. 27, 1909, was agreed upon for the test, it being the first day upon which the staff could conveniently attend.

"The fire chief had, previous to the test, outlined what he regarded as proper requirements to be demanded in view of the conditions at Beloit, which requirements are as follows: Eight streams, from four centrally located hydrants, running simultaneously for five hours and each through 250 or 300 feet of hose and a 1⅛ inch smooth nozzle; streams to reach a height of 75 feet, when thrown vertically in still air.

"This report treats only the observations on the streams thrown and the water supply as observed by the writer, assisted by Messrs. De Boos and Hatch.

"*Water Supply.* Two of the three pumping stations belonging to and operated by the Beloit Water, Gas and Electric Company pump water direct from driven wells alone, and the third plant, known as the steam station, is arranged to pump from any of the following sources:

"1. Twelve six-inch driven wells about 80 feet deep.
"2. 400,000 gallon reservoir.
"3. 116,000 gallon elevated tank.
"4. Large covered well (27 feet inside diameter).

"Starting with the latter full of water (gauge height 14 feet), probably 50,000 gallons could be taken from it in addition to the inflow during continuous pumping therefrom, before losing suction. If this well be included, the company appears to have water storage capacity of approximately 566,000 gallons in addition to the available flow of their wells. Without this well the capacity would be 515,000 gallons. No estimate of the rate of flow obtainable from the wells was made, as the means of obtaining data for such estimates were not at hand. The records on file in this office concerning the property of the Beloit Water, Gas & Electric Company show the following information as to the driven wells at the three pumping plants:

Plant.	Wells.		No. connected and pumped.	Disconnected.	Total
	Size.	Depth.			
W. side hydraulic	4 in	80 ft.	17	5	22
	5 in	80 ft.	0	1	1
	6 in	80 ft.	8	0	8
E. side hydraulic	6 in	80 ft.	8	0	8
E. side steam	6 in	80 ft.	12	0	12
			45	6	51

TABLE A.

STATEMENT OF HEIGHTS OF FIRE STREAMS.

	As observed by			
	City engineer.		Commission's engineer.	
	Height.*	Time.	Height.*	Time.
Hydrant A, or No. 1, at Golden Eagle Clothing House	68.2 ft.	....	59½ ft.	3:14
Hydrant B, or No. 2, at Beloit State Bank	66.5 ft.	... .	65.5 ft.	3:15
			69.3 ft.	4:10
Hydrant C, or No. 3, in Back street	38. ft.	... .	40. ft.	4:16
Hydrant D, or No. 4, North 3rd street near Race	52. ft.	....	54. ft.	4:25

*Measured above hose connection on hydrant.

"The company's reason why six wells at the west side (hydraulic) pumping plant are not connected has not yet been ascertained.

"The state of the supply stored in the large well and in the reservoir was observed at all times during the test. The depth or amount of water in the elevated tank before the test was not observed, as the water gauge on the tank was out of order, but at about 2:40 o'clock the tank was discovered to be empty. It therefore appears that by the time the test was stopped (4:32 p. m.), the stored supply was very low. Assuming the tank to have been full at the beginning of the test, as stated by the engineer at the plant, and considering the amount taken from the reservoir and the probable amount taken from the large well, also the amount of water pumped by this station during the test, it would appear that comparatively little was drawn from the twelve deep wells at this plant.

"It is estimated that approximately 258,000 gallons were taken from the reservoir, which lacked 23″ in depth or 57,600 gallons of being full at beginning of the test, 54,000 gallons from the large well in addition to the inflow into that well during the time the pumps were taking water from same, and that 115,000 gallons were taken from the tank. These figures aggregate 427,000 gallons. As the mechanical engineers report 573,000 gallons as the amount pumped from this station during the test, there appears to have been only 146,000 gallons obtained from the inflow into the large well during pumping therefrom, and from the twelve driven wells. It appears from statements made to the writer on May 10 and 11 by the night engineer of this plant and Mr. Wiley, the company's superintendent of the water department, both of whom are understood to have been in the plant during the test, that no water was pumped from the deep wells at this station until about 1:30 p. m.

"The company's plan of operation in case of fire appears to be as follows: A man is sent to the west side (hydraulic power) pumping station to speed up the pumps there. These pumps are generally kept running continuously, but without a regular attendant present.

"The electrically driven centrifugal pumps in the new plant adjacent to the electric station are also started when the alarm is sounded, if not then running.

"The steam pumps, in the third (original) plant, usually operated but a few hours each day, are also started if not already running. Water is taken by these steam pumps from the reservoir and elevated tank until the steam pressure is raised to the required amount and the fires are gotten in good condition, or until this reserve supply is exhausted. Taking water from those sources relieves the suction head entirely and materially decreases the work required of the plant during the time steam pressure is being raised to the required amount. The company appears to have no fear of limit to its water supply, at least so far as the capacity of its pumps of the probable demands of the city are concerned.

"The question of necessity of making continuous use of the full storage capacity of reservoir and tank appears probably less important in this case from the standpoint of water supply, than from that of adequate fire pressure during the time required to raise the steam necessary when working under a large suction head.

"From either standpoint it seems important that the reservoir and tank be kept filled as continuously as possible, and steps should be taken to prevent laxity in the matter.

"The trying experience with the fires under the boilers at this plant during the test, and which is regarded as the cause of the failure to supply better pressure, is evidence of the necessity for some improvements in equipment or in operating methods.

"Between the date of the test and that of the writer's recent trip to Beloit (May 10 and 11), the company increased the chimney draft at the steam pumping station by putting up a steel stack on top of the old brick chimney.

"*Fire Streams Thrown.* The alarm which was the signal calling for the test referred to was turned in at 11:04 a. m. About six minutes later, or at about 11:10 o'clock, the first of the four hydrants used was opened, supplying two streams. This hydrant is the one in front of the Golden Eagle Clothing Store on East Grand avenue near State st., and has been referred to in the field notes and elsewhere as hydrant 'A.'

"The three other hydrants in service during the test have been designated 'B,' 'C' and 'D,' and are located as follows: 'B' in front of Beloit State Bank on East Grand ave., about 200 ft. west of the river; 'C' in Back st., about same distance west of river; 'D' on Third st., north of and near Race st. These hydrants were opened at 11:15, 11:18 and 11:17, respectively, each supplying two streams. At each hydrant one of the two lines of hose was attached to one leg of a siamese connection, on the other leg of which was a pressure gauge. The chief of the Beloit fire department, Mr. J. E. Nygren, had a man stationed at each of the hydrants to read and record the pressures indicated by the gauges. Pressure readings five minutes apart were taken by these men simultaneously, on bell signal from the central fire department station.

"Independent record was made by members of the staff showing pressure gauge readings, frequently though irregularly observed. These observations serve simply to check the more complete records made by the city's men. The two sets of records have been found to agree fairly well.

"Observations on heights of streams were made by the writer, using a transit borrowed from the company. Similar measurements were made for the city by the city engineer, Mr. R. R. Caldwell. Readings in both cases were for heights of highest drops. Remembering the variations of water pressure, wind, etc., and consequent variations of height of streams during the test, it will be obvious that the time of making each observation on height should be noted. The city engineer has submitted, through the city attorney, a statement of stream heights observed by him, but without record of the time of making any of his observations. It is therefore difficult to compare our results with his. All these observations are shown in table 'A' herein.

"The treatise by John R. Freeman, on 'Hydraulics of Fire Streams,' which was published in Vol. XXI, Transactions American Society Civil Engineers, furnishes a basis for interpretation and comparison of certain data obtained in this test.

"Two original diagrams have been prepared from tables contained in the Freeman paper mentioned above and are shown in connection with this report.* By the former and figure 2, it appears that three of the four hydrants in service during the test furnished streams which should be regarded as fairly satisfactory for the conditions in that part of Beloit. We know of no buildings in that city taller than the Y. M. C. A. building and the Goodwin Block, the latter an office building. Each of these has four stories and their walls reach a height of fifty-two feet above the sidewalk level. The Goodwin Block has an elevator tower sixty feet above the street. Some of the Beloit college buildings are also four stories high, and are on ground approximately forty feet above the street at the Goodwin Block, so that, while service requirements would seem to be somewhat more severe as regards station pressure to give equally strong streams at the college, the fire hazard at this place is hardly comparable with that in the heart of the business district, owing to the great difference in spacing of buildings, the college buildings being well scattered.

"A Beloit map submitted by the city engineer, showing elevations of streets throughout the city, indicates that the levels range from 17 ft. to 75 ft. above the city datum, or a variation of 58 feet, though within the more thickly settled part of the city the variation seems to be about 50 feet. On account of the fact that the greater fire hazard exists in the compactly built business district, and the further fact that the difference in extreme levels is about as given above, our conclusions in this matter are as follows:

"1. The part of the test in charge of the firemen was conducted in a part of the city and on a level where the fire service requirements are likely to be and to remain greatest.

"2. The station pressure required for equally satisfactory service at fires on the higher levels of the city would probably be slightly, though without further investigation not clearly materially, less than for fires in the business district which is on the lower levels.

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* Diagrams not reproduced here.

"3. Three of the four hydrants in service during the test gave streams which, although failing to reach the full height specified by the chief of the fire department, remained 'good effective fire streams' up to heights equal to those of Beloit's present highest buildings, except during nearly one and one-half hours between 2:30 and 4:00 o'clock p. m. During that period they could be regarded only as 'fair' fire streams at the same heights, the decrease in effectiveness being due to the reduction of pressure.

"4. The test showed at least one hydrant on the system to be defective and the chief of the fire department has stated that there are other such hydrants. It may be noted in this connection that we learned that the city since notified the company of a determination to cease paying rental for the defective hydrant in Back street until said hydrant is put in good condition, and Mr. Lyons, assistant general manager of the company, states that that has now been done.

"5. The company's present water supply and storage capacity appear to be, when properly handled, adequate to meet all demands likely to be made on them at present and probably for several years to come.

"The following special recommendations are respectfully submitted in connection with this matter:

"1. An examination to determine defective hydrants be made of all hydrants not known to the city authorities to be in good order and capable of showing proper pressure.

"2. The prompt correction or elimination of defects in such hydrants.

"3. Steps to be taken to insure that the reservoir and tank be kept well filled.

"4. Recording gauges be installed and arranged to furnish continuous record of the guage heights of water in both reservoir and tank, and that the records obtained shall be open to inspection by city authorities both before and after removal from the recording guage on which they are made."

Mechanical and other inspections made by the staff since the test above noted indicate that the defects noted have since been corrected and the plant is today in condition to furnish adequate fire protection to the city.

CRENOTHRIX.

It is the contention of the city that a certain growth or deposit, known as "Crenothrix," exists to an extent in the water mains and services of the company which is sufficient to materially reduce the value of the system.

Prof. H. L. Russell, bacteriologist, testifying for the city, described and defined the growth or deposit referred to as follows:

> "The deposit in this case is due to a biological action going on in the water; now this water containing iron in solution offers a favorable food medium for the growth of certain organisms capable of developing away from the light. * * * This is one of the lower forms of organisms that is closely allied to bacteria and lower algae and capable of multiplying in the absence of sunlight. It requires for nourishment soluble iron, iron in solution. Waters derived from certain strata in the soil, especially where there is organic matter present, reduce the iron which is present in almost all soils and throw it over into the soluble form, so that the water, as it wells up from these wells, contains this iron in solution. This organism (crenothrix) is then able to grow in the absence of sunlight, and multiply and develop, and lives upon this soluble iron, changing it, however, from the soluble into the insoluble form; chemically speaking, changing it from the ferrous form over to the ferrick oxide form; that causes precipitation of iron in the ferrous form insoluble and in the ferric form soluble. These ferrics precipitate in a sheath or substance of the soil in the insoluble form that goes on and accumulates until there is evident an incrustation of oxide of iron. As long as there is iron in solution this organism will grow."

Prof. Russell stated that he had examined samples of water taken from several places in the Beloit system, and the result of these analyses are shown below:

Sample No.	1	5	3	2	4
Location	East side.	East side.	East side.	West side.	West side.
Turbidity	0	0	0	0	0
Color	0	0	0	0	0
Odor	0	0	0	0	0
Total solids	150.6	152.0	149.7	160.3	172.5
Loss on ignition	58.2	59.2	61.3	61.2	71.6
Chlorine in chlorides	18.0	8.0	20.0	6.0	5.0
Oxygen consumed	1.8	1.2	1.5	2.0	0.9
Nitrogen as free ammonia	0.08	0.08	0.07	0.09	0.05
Nitrogen as albuminoid ammonia	0.18	0.13	0.15	0.14	0.10
Nitrogen as nitrates	0	Slight trace.	Slight trace.	0	0.005
Nitrogen as nitrites	Trace.	0.05	Trace.	Trace.	0.06
Alkalinity	128.0	137.2	138.1	135.0	140.5
Sulphates	....	....	....	....	....
Iron	Slight trace.	0	0	0.85	0.84

Note:- Amounts are stated in parts per million.

Prof. Russell stated that the above examinations or analyses showed that the water is wholesome, so far as considered from the standpoint of disease production. The sample taken from the closed well at the west side plant, the one taken from the drinking fountain in the Parker school, and the one taken from the east side tubular wells, and numbered 2, 4 and 1, respectively, were all found to show iron, sample No. 1 showing only slight traces of iron while 2 and 4 showed 0.85 and 0.84 parts per million, respectively. Samples 3 and 5, obtained from water supplied from the east side wells, showed no trace of iron whatever.

Prof. Russell stated that the presence of the quantity of iron noted in samples 3 and 5 indicated that the water which is derived from these wells comes from stratum containing iron in solution. An examination of a sample of service pipe made by the witness showed the presence of crenothrix organism, and witness stated that the presence of iron in solution in the waters would facilitate the growth of the crenothrix organism. Witness further stated that the quantity of iron necessary to permit the growth of the organism is about 0.3 parts, under the conditions. Witness found that the conditions shown by his analysis were decidedly favorable to the growth of crenothrix.

Examination of the deposit in the service pipe submitted showed to the witness that the deposit is not the substance upon which the organism in question lives, but is the production of the crenothrix in the system.

Regarding the effect of the crenothrix deposit as above described on the mains and services of the water works system, Prof. Russell stated that in his experience he had seen instances where the deposit had accumulated to such an extent as to materially affect the flow in the pipes, retarding it to a considerable degree. The witness also stated that while the existence of the organism and deposit is not dangerous to health at all, it does discolor the water and impair its usefulness for culinary and domestic purposes, as it causes rust spots in laundry and has other bad effects when used for general domestic purposes.

Prof. Russell believed that the existence of the deposit to the extent found in the service pipes uncovered would indicate that the mains were also affected. He insisted, however, that actual examination of the mains themselves was necessary to demonstrate that they had been affected.

In view of the above testimony as regards the nature of the growth found in the service pipes, and the fact that similar conditions were found in other services, and that conditions favorable to the growth of crenothrix had existed for a number of years, the city contends that these are facts which should materially reduce the present value of the water works system. It is also pointed out by the city that the examinations made show that the presence of the soluble iron in the water of the west side wells indicates where the source of the danger from crenothrix lies. It is further contended by the city that the responsibility for the present condition of the pipes is directly with the company, since in establishing its west side supply and its use, the company has violated the original franchise under which it was allowed to do a water supply business in Beloit, which franchise the city claims specifies that the water shall be drawn from wells on the east side. The city in conclusion submits: (1) That the source of supply at the west side of Rock river should be abandoned; (2) that the present value allowed to the water department property, as set for the normal conditions supposed to exist when the valuation was made, be materially reduced; (3) that the company be required to bear the cost not only of cleaning and replacing services from the main to the curb, but also from the main to the faucet; (4) that the cost of such cleaning and replacing be not allowed to the company as a part of their operating expenditures upon which rates can be based and income earned.

The company, on the other hand, calls attention to the testimony of Prof. Russell that the deposit in question comes from the iron in the water and has no effect on the pipe, except in so far as it may adhere thereto, that it is in no sense an impurity dangerous to health, and that the best evidence of whether it had adhered to the mains was the condition of the mains themselves, and that if it appeared that sections which had been taken up disclosed little or no deposit, it would be the best evidence that crenothrix was not affecting them or impairing their life.

In this connection, and in view of the testimony of Prof. Russell, the company refers to the sections of main pipe taken up and produced as evidence before the Commission, which sections of mains showed practically no deposit of any nature whatever.

As regards the presence of the deposit in service pipes, the company contends that the services so affected and which have been taken up and replaced, or have been cleaned, constitute less than 2 per cent of the total number of services in the system, and that the services so described are in nearly all instances where there is a small but continuous flow of water, and that it is in such services where a deposit is most likely to be made. The company further asserts that in the same locality where obstruction in services caused by defective plumbing or a trickling flow of water has been evidenced. other pipes having normal usage are found to be free from deposit.

It would appear to be clearly established by evidence and testimony that crenothrix exists in the distribution system of the respondent. That the deposit due to this growth has seriously affected the capacity of certain services is also established. The analyses made would also appear to point to the water of the west side wells as largely, if not entirely, responsible for the existence of the growth. Further analyses and investigations show that the deposit found does not affect the life of the mains or services as far as the life of the material in these mains and services is concerned. The effect of the growth and deposit is to reduce the carrying capacity of the system, to increase the pressure necessary to furnish adequate supply for all purposes, to increase the cost of pumping, to increase the cost of maintaining the system, and to lessen the usefulness and value of the supply for domestic and industrial purposes.

Where the growth in question with the deposit which follows has assumed such proportions as to seriously and materially affect the value of the water supply in other cities, it appears that the difficulty has been overcome temporarily or permanently by cleaning the mains, or by treating the water to eliminate the elements upon which the crenothrix lives and thrives. Processes are used which successfully accomplish this result.

In view of these and other facts in regard to the existence of crenothrix in the mains and services of the company, the effect of this growth in the water supply and the system, its present extent and probable future increase, the source of the iron upon which the growth depends, and the methods and cost of prevention and elimination, it would appear that the presence of the growth and its probable future increase are elements properly considered in determining the value of the utility for rate-making purposes. It is not believed, however, that the conditions as at present existing are such as to justify any material reduction in the valuation because of this element, or are such as to justify any action by the Commission in regard to the discontinuing of the west side wells, or other action along this line. It is believed, however, that the exercise of ordinary foresight on the part of respondent will lead to measures necessary to prevent the future growth of the organism and deposit, and that it is to the best interests of both the utility and the public that conditions be carefully watched and the usefulness of the water supply and system be protected wherever the facts show that such measures are necessary.

CONSOLIDATION.

It was one of the chief claims of the city that the water utility should not be valued or considered as it exists with the several scattered stations, but as a system with all four plants consolidated at the east side steam plant. This claim was based on the principle that clear and gross engineering mistakes, and other mistakes or defects, should not be charged up against the public, and that the utility as it exists today, with the scattered stations, is fundamentally and seriously defective and inefficient, and because of this reason is operating at an abnormally high cost.

Mr. Sturtevant, testifying for the city, gave it as his belief and conclusion, after examination of the plants and the operating conditions and expenses, that the several pumping stations should be consolidated into one central plant. Testimony of the same nature was given by Mr. Wheeler, and also by Mr. Fowle and Mr. Evans.

Mr. Fowle, in his report on the water department, analyzes the operating costs for several yearly periods and estimates that a saving of about $35,000 in construction cost and about $4,376 in yearly operating expenses, including taxes, depreciation and interest, could be effected if the plants were consolidated at the east side station.

Some light may be thrown upon the investment in respondent's water utility and the operating expenses by a comparative study of the investment and unit costs of other water utilities in Wisconsin. The engineering staff of the Commission has inventoried and appraised the physical property of about twenty-two water works in the state. Some comparative analyses of these detailed valuations are shown in the following tables and discussions.

The following table shows a percentage distribution of the investment in the various groups of the inventory made by the staff:

TABLE XLII.

SHOWING PERCENTAGE DISTRIBUTION OF TOTAL COST NEW.

Name of city.	Land.	Wells, intakes, suctions.	Filters. reservoirs. standpipe.	Distribution system.	Power plant equipment.	Buildings and miscellaneous structures.	Office furniture and appliances.	Tools.	Miscellaneous.
Antigo	9.15	7.45	6.57	64.93	7.48	3.74	0.07	0.61	....
Appleton	2.12	6.00	5.17	64.34	10.58	11.56	0.05	0.23	....
Ashland	1.30	16.16	11.71	56.49	8.72	4.70	0.28	0.51	0.13
Baraboo	3.89	11.82	6.25	56.23	9.86	11.44	....	0.51	....
Bayfield	3.48	13.52	4.91	63.06	7.21	6.30	0.27	0.51	0.14
Beloit	6.44	6.42	6.51	57.96	11.67	10.12	0.42	0.40	0.06
Chippewa Falls	0.15	3.82	6.00	77.83	7.73	3.76	0.23	0.40	0.08
Darlington	0.43	1.55	6.05	80.57	5.20	6.14	....	0.06	....
Fond du Lac	2.03	7.88	3.86	66.52	15.56	3.67	0.25	0.18	0.05
Hillsboro	....	2.78	31.63	59.50	4.80	1.29	....	....	....
Janesville	3.29	5.63	7.79	69.33	7.83	4.67	0.31	0.78	0.31
Jefferson	2.49	6.85	9.01	67.03	10.41	3.81	0.06	0.34	....
Madison	9.39	9.20	4.75	62.43	9.09	4.06	0.28	0.25	0.55
Manitowoc	5.48	9.60	6.22	69.22	3.73	5.05	0.28	0.27	0.16
Marinette	0.41	20.75	2.03	55.86	6.76	13.63	0.11	0.23	0.22
Mellen	6.79	0.25	3.08	32.85	15.33	38.60	0.54	0.87	1.69
Menomonie	0.58	7.10	6.80	68.49	7.19	9.39	0.10	0.35	....
Oconto	1.94	10.24	5.87	63.98	9.91	7.57	0.25	0.24	....
Ripon	2.07	13.40	5.80	66.21	6.96	4.87	0.41	0.15	0.13
Stevens Point	0.62	3.56	8.15	66.83	11.62	8.46	0.27	0.37	0.12
Superior	3.03	15.76	8.64	60.29	9.13	2.33	0.17	0.14	0.45
Washburn	0.25	4.76	6.71	72.55	8.12	7.19	0.05	0.37	....
Average	3.10	8.39	[1]6.28	63.75	8.86	[2]6.37	0.23	0.37	[2]0.20
Median	2.30	7.10	6.25	64.50	8.50	5.50	0.27	0.35	0.14
Minimum	0.15	0.25	2.03	32.85	3.73	1.29	0.05	0.06	0.05
Maximum	9.39	20.75	31.63	80.57	15.56	38.60	0.54	0.87	1.69

[1] Hillsboro excluded.
[2] Mellen excluded.

TABLE XLIII.

TABLE SHOWING PERCENT DISTRIBUTION OF MAINS OF VARIOUS SIZES.

	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	20 in.	Cost per mile of main.
Antigo	....	1.85	4.11	0.63	....	10.15	....	....	6.55	62.72	11.75	12.44	....	....	....	....	$4,355
Appleton	....	14.81	9.96	0.63	2.21	11.01	....	0.37	6.22	37.50	11.44	2.74	2.00	....	1.11	....	3,620
Ashland	....	0.58	2.81	2.22	1.10	0.92	....	....	4.03	62.36	8.89	3.83	7.59	....	5.33	0.34	5,940
Baraboo	....	....	0.29	0.50	7.51	0.72	....	0.72	3.40	69.50	1.67	13.27	2.42	....	....	....	....
Bayfield	2.0	....	2.7	2.9	1.8	14.6	....	13.3	29.7	16.4	16.6	....	....	....	....	....	3,775
Beloit	....	....	....	....	....	....	....	2.3	17.0	57.0	12.9	7.1	3.6	0.1	....	....	5,480
Chippewa Falls	....	....	....	....	....	0.5	....	....	9.9	70.7	4.8	2.2	11.9	....	....	....	8,400
Darlington	....	19.8	....	....	0.7	2.4	....	3.2	60.0	1.7	12.2	....	....	....	....	....	3,000
Fond du Lac	....	....	....	....	....	....	....	....	15.4	44.9	33.0	2.9	....	3.8	....	....	5,600
Hillsboro	....	....	....	9.1	11.1	58.4	....	....	21.4	....	....	....	....	....	....	....	1,417
Janesville	....	0.8	1.5	0.9	1.2	20.0	....	....	3.2	50.7	14.8	3.9	1.3	....	1.7	....	4,390
Jefferson	....	....	....	....	....	....	....	....	67.9	20.4	5.3	6.4	....	....	....	....	3,910
Madison	....	....	....	....	....	....	....	0.2	52.5	29.2	10.7	6.9	....	0.3	0.2	....	4,040
Manitowoc	....	....	....	0.3	0.7	5.2	0.3	....	2.8	68.9	11.8	3.8	0.6	....	5.6	....	5,950
Marinette	....	0.9	7.8	0.1	5.4	17.3	....	....	0.8	43.7	18.0	2.3	3.7	....	....	....	4,865
Mellen	....	....	....	8.5	....	10.4	....	22.6	21.7	36.8	....	....	....	....	....	....	2,970
Menomonie	....	....	....	....	....	....	....	....	34.40	51.45	....	14.15	....	....	....	....	4,600
Oconto	....	16.45	0.28	....	11.78	0.46	....	....	5.40	38.33	18.50	3.94	4.84	....	....	....	....
Ripon	....	....	7.78	....	1.11	0.52	....	....	14.15	57.37	8.72	5.01	5.34	....	....	....	....
Stevens Point	....	....	....	....	....	....	....	....	8.5	68.2	5.9	6.3	10.3	0.8	....	....	5,345
Superior	....	0.1	0.2	....	....	0.7	....	....	7.0	51.1	12.3	3.4	21.2	0.4	3.6	....	7,380
Washburn	....	12.4	....	....	1.1	7.6	....	....	3.2	58.7	5.7	11.3	....	....	....	....	5,000

The Beloit water utility shows a percentage of total investment in power plant equipment and in buildings and miscellaneous structures, which is somewhat in excess of the average for all the plants listed. This is due, in a large measure perhaps, to the existence of several pumping stations with their separate equipments. Peculiar local conditions explain the few unusual figures occurring in the table.

Table XLIII shows the percentage distribution of the various sizes of mains of the same utilities. The approximate cost per mile of main is also shown.

A comparative analysis of the investment in the several groups shown in table XLII and for the same plants listed therein has also been made. The investment in each group has been determined as per M gallons pumped, per consumer and per mile of main. This analysis shows no unusual conditions in Beloit, and the unit investments are about the average for the plants considered, all of which have been valued by the Commission's staff.

Turning from the question of investment to that of operating cost, several summaries of the expenses for class A plants in the state are presented below:

SUMMARIES OF EXPENSES FOR CLASS A PLANTS.

Year ending June 30, 1910.

PERCENTAGE DISTRIBUTION OF OPERATING EXPENSES.

	Pumping.	Distribution.	Commercial.	General.	Undistributed.	Total of foregoing.
Minimum..........	29.10	3.00	0.17	1.19	0.23	100.0
Maximum..........	84.20	43.43	23.00	64.00	7.97	100.0
Average..........	58.03	12.92	5.85	22.27	2.38	100.0
Median..........	58.31	8.55	5.67	18.90	1.08	100.0
Beloit..........	64.13	5.88	1.13	27.70	1.16	100.0

COSTS PER MILLION GALLONS PUMPED.

	Pumping.	Distribution.	Commercial.	General.	Undistributed.	Total of foregoing.
Minimum..........	5.51	0.78	0.08	0.35	0.07	11.92
Maximum..........	64.37	15.55	5.14	26.89	3.50	83.22
Average..........	19.74	4.32	1.63	7:39	0.69	33.36
Median..........	14.93	3.50	0.97	6.23	0.24	30.15
Beloit..........	15.95	1.46	0.28	6.88	0.29	24.86

PER M GALLONS PUMPED.

	Pumping.	Distribution.	Commercial.	General.	Undistributed.	Total of foregoing.
Maximum	4.540	0.0183	0.0204	0.1136	0.0086	4.540
Minimum	0.007	0.0008	0.0001	0.0006	0.0001	0.011
Average	0.032	0.0045	0.0025	0.0121	0.0015	0.059
Median	0.018	0.0026	0.0021	0.0125	0.0006	0.041
Mode	0 018	0.0014	....	....	....	0.044
Beloit	0.016	0.0015	0.003	0.0039	0.0003	0.025

PER CONSUMER.

	Pumping.	Distribution.	Commercial.	General.	Undistributed.	Total of foregoing.
Maximum	9.01	2.380	0.864	5.60	0.83	13.20
Minimum	2.32	0.185	0.016	0.64	0.01	4.07
Average	5.01	0.735	0.377	3.13	0.27	8.85
Median	4.67	0.510	0.341	3.23	0.13	9.31
Mode	4.40	....	....	....	....	9.40
Beloit	6.74	0.488	0.116	2.91	0.13	10.50

PER MILE OF MAIN.

	Pumping.	Distribution.	Commercial.	General.	Undistributed.	Total of foregoing.
Maximum	627	308.0	68.6	385	54.2	1,056
Minimum	136	25.8	1.2	7	1.1	260
Average	346	66.5	30.0	195	14.6	614
Median	292	40.2	32.6	197	11.0	594
Mode	266	27.0	....	....	....	579
Beloit	530	62.0	9.1	229	9.9	828

It is also interesting in this connection to note the following general summary of the protective features of respondent's water utility, as taken from a report made in recent years upon the fire hazards, etc., in Beloit for fire insurance purposes:

"Water works system, as a whole, meets about 75 per cent of standard requirements, pumping capacity being about 84 per cent, distributing system 60 per cent, and the hydrant and value 81 per cent of standard requirements. Favorable condition of the water works system is the fact that there are three pumping stations which are operated by steam, electricity, and water power, respectively."

STATISTICS OF OPERATION.

The respondent has submitted an analysis or distribution of the total pumpage for the year 1909. "The total pumpage for 1909, as recorded, was 733,292,611 gallons, having previously taken account of slip in pumps. Correcting the error in the meter at the electric station for eleven months will reduce this pumpage to 685,757,459, or, say, 685,800,000 gallons." The estimate of the water used by the city includes the use of water in the jail, fire stations, council rooms, schools, flush tanks, drinking fountains, cemetery, street sprinkling, and for fires.

The total of the use by these consumers is estimated as 43,700,000 gallons during the year, which includes 15 per cent for leakage. Fairbanks, Morse & Co., and the two railroads are reported as using 265,000 gallons. Domestic and private and industrial consumption is estimated as 377,100,000 gallons.

"It should be noted that in the foregoing figures 15 per cent has been allowed for leakage in figuring city consumption. The large consumers are based on meter readings and an estimate of the water used by the railroad companies. The figure for private consumers contains leakage and unaccounted for water. Based on a leakage of 3,000 gallons per mile of main per day, the leakage in Beloit would amount to approximately 4 per cent of the pumpage.

"The number of consumers Jan. 1, 1909, was 1,682; Jan 1, 1910, was 1,764; average was 1,723. Deducting the three large consumers, and 24 city consumers, the average number of consumers is 1,696. The pumpage to private consumers was 377,100,000 gallons.

Gallons per year per average consumer	**222,347**
" " day " " "	**609**
" " capita per year	**45,720**
" " " " day	**125**

The above estimates are as presented by the respondent in the hearings before this Commission *In re Beloit Water, Gas & El. Co. v. City of Beloit* (Vernon avenue extension), 5 W. R. C. R. 617, and the opinion of the Commission in that proceeding is repeated below:

"These figures represent the conclusion of the witness with respect to the pumpage statistics of the plant. They also appear to be the figures upon which his calculations as to the cost per consumer are largely based.

"The preceding pumpage statistics have thus been corrected so as to offset an error due to a fast meter, and have also been divided among three classes of users. The first of these classes includes the city, or the public use; the second includes three large consumers, namely one large manufacturing plant and two railroads; the third covers all the rest of the consumers, or those termed above as 'private,' and includes residences, stores, office buildings, hotels, restaurants, saloons, boarding houses, flats, theaters, laundries, factories of all kinds, warehouses, schools, including Beloit college, etc. From an examination of the consumers that are thus included in the third class, it would seem that the average use of water per consumer, when all of them are included, must be considerably greater than the average use of water for the smaller residence consumers.

"That an average pumpage of 125 gallons or more per capita per day for residence consumption alone is higher than the ordinary estimates of such pumpage, is evidenced by many facts. In cities where meters are used the average daily use of water per capita seldom exceeds 25 gallons. Waterworks men of large experience, as well as technical journals, seldom place the daily average use of water above 18 or 25 gallons. These figures indicate that with four persons to the family the average use of water for each family would range from 25,000 to 30,000 gallons annually. It is, of course, a fact that where no meters are used the waste of water is much greater than where meters are installed. As comparatively few meters are in use in Beloit, the pumpage in that city will undoubtedly exceed the figures just given, but that they should be fully seven times as great is, to say the least, surprising.

"It is fully appreciated that reliable statistics in regard to consumption and pumpage of water per consumer are difficult to obtain, and that a large proportion of the available data upon this subject are of questionable value for application to particular cases. The Commission has previously had occasion to remark upon these matters.

"'Unfortunately the water utility field is marked by an absence of reliable and satisfactory data. * * * Although old in the number of years of service, this business has not furnished records of operating conditions and influence affecting it except in the most general conclusions. * * * Statistics which are at all reliable, showing an installation of water fixtures, consumption data, leakage information, classes of consumers, etc., all of which elements vitally affect the rates, are very difficult to obtain. Even where data are available, the results must be used with great caution, since they are affected largely by the character of the population of the respective cities, climate conditions, industrial and social conditions and other factors, so that frequently the value of such information is greatly diminished for comparative purposes. This absence of record information makes necessary frequent resort to estimates, which, regardless of the most careful computation, give rise to an element of uncertainty.' *City of Ripon v. Ripon Light & Water Co.* 5 W. R. C. R. 1, 72.

"This applies to Beloit as much as to other places. In fact, the situation in this respect in that city seems to be such that the pumpage and consumption per consumer can be ascertained with reasonable accuracy only through most thorough and comprehensive investigation and tests. The six consumers, however, who would be served by the proposed extension, are all residence consumers and can safely be classed as comparatively small users of water. In fact, the largest of these six houses does not appear to have cost more than $3,000.

"In view of these facts, and in view of the further fact that the figures upon which the average pumpage of 222,347 gallons per consumer per year was determined includes about 32 saloons, 5 hotels, 4 boarding houses, 6 restaurants, 7 livery stables, 3 laundries, 12 factories and all other large consumers except the city, the large factory and the two railroads mentioned above, it would seem that the average pumpage that will be required for each of the six consumers in question will not be likely to greatly exceed 180,000 gallons annually. Even this looks like a comparatively high figure." *Beloit Water, Gas & El. Co. v. City of Beloit,* 5 W. R. C. R. 617, 619—621.

The reported pumpage for the year ending June 30, 1910, was 710,589,986 gallons. Apportioning this pumpage on the same basis as that given by respondent for the 1909 pumpage, we have 6.37 per cent delivered to the city, 38.64 per cent delivered to the railroads and Fairbanks Morse, and 54.99 per cent to private consumers.

An analysis of the water consumers in Beloit has been made and the following table shows the distribution of the various classes of consumers according to the annual flat rate paid:

TABLE XLIV.

ANALYSIS OF BELOIT WATER CONSUMERS.

As of Jan. 1, 1911.

RATE.

	$5	$6	$7	$8	$9	$10	$10 50	$11	$12	$12 75	$13	$14	$14 50	$15	$16	$16 62	$17	$18	$18 50	$19	$20	$21	$22	$23	$24	$24 80
Residences	167	22	32	219	7	50		9	211		4	26		5	154		7	142		9	20	7	137	5	12	
Flats		13	1	1	5	13		13	12		4	3			6		9	35					2			
Stores		22		1		66			4			5			3			1	2		2					
Offices	1	25				7			3			2						2		1						
Barber shops		2			2				2		2				1								1			
Lodge rooms		4				1					1	3						3					3			
Churches							1		3	2			1			1										
Garages						1			3																	
Hotels																										
Saloons																										
Livery																										1
Laundry																										
Greenhouse																										
Restaurants and bakeries						5						1			2								1			
Factories						2																	2			
Photo galleries												1			2			1								
Apartments																										
Tenants using public openings	51																									
Theaters						2																	1			
Pool rooms						1																				
Chemical lab																										
Hospital																										
Total	239	88	33	221	14	148	1	22	238	2	11	41	1	5	168	1	16	184	2	10	22	7	147	5	12	1
Revenue	$1,195	$528	$231	$1.768	$126	$1,480	$10 50	$242	$2,456	$25 50	$143	$574	$14 50	$75	$2,688	$16 52	$272	$3,312	$37	$190	$440	$147	$32 34	$115	$288	$24 80

TABLE XLIV.

ANALYSIS OF BELOIT WATER CONSUMERS—Concluded.

As of Jan. 1, 1911.

RATE.

	$25	$26	$27	$27 50	$28	$29	$30	$31	$32	$33	$34	$35	$36	$37 50	$38	$40	$40 50	$43	$48 80	$52	$53	$55 70	$58	*$80	*$120	*$132	Total.
Residences	13	7	8		2	9	4	3		3	2				1	12											1,329
Flats																											117
Stores							1																				107
Offices		2																									43
Barber shops					1						1																12
Lodge rooms				1																			2				18
Churches														1			1										11
Garages																											4
Hotels									2	1											1						4
Saloons	5						11					9	1			3											29
Livery																			1	1		1					4
Laundry	1																										1
Greenhouse	1																										1
Restaurants and bakeries																1											10
Factories																		1									5
Photo galleries																											4
Apartments																								1	1	1	3
Tenants using public openings																											51
Theaters																											3
Pool rooms																											1
Chemical lab.									1																		1
Hospital														2													2
Total	20	9	8	1	4	9	16	3	3	4	3	9	1	3	1	16	1	1	1	1	1	1	2	1	1	1	1,760
Revenue	$500	$234	$216	$27 50	$112	$261	$180	$93	$96	$132	$102	$315	$36	$112 50	$38	$640	$40 50	$43	$48 80	$52	$53	$55 70	$116	$48	$72	$79 20	$24,035 52

*Less 40% discount.

The analysis of the Beloit water consumers as of Jan. 1, 1911, shows a total of 1,760 consumers, divided into classes under fifty-two different rates. There are 1,329 residences, 117 flats, 107 stores, 43 offices, 29 saloons, 51 tenants using public openings, 18 lodge rooms and halls, and the balance of 66 consumers being scattered among churches, garages, hotels, theaters, etc.

The largest groups of consumers falling under the various rates are $5 rate, 239; $12 rate, 238; $8 rate, 221; $18 rate, 184; $16 rate, 168; $10 rate, 148; $6 rate, 88; $14 rate, 41; $7 rate, 33 consumers.

70 per cent or 1,232 consumers, pay $16 or less. Computing the revenue for the consumers under each rate, gives a total revenue from all consumers of $24,035.52. Adding to the above amount the revenue from special consumers, we obtain a total revenue which exceeds somewhat the figure reported for the year ending June 30, 1910.

APPORTIONMENT OF WATER DEPARTMENT VALUES BETWEEN PUBLIC AND PRIVATE SERVICE.

The Commission has been called upon in several cases to determine the fair and equitable burden of expense of water works operation which should be borne by the public. Since the total costs upon which rates must be based include such items as taxes, depreciation, and interest on the investment, and since these expenses are directly proportional to the amount of the investment, it is at once evident that before distributing the costs between the several branches of service it is first necessary to apportion the total investment between services rendered. In water works operation the principal branches of service are public service, including fire protection, public buildings, flushing sewers, fountains, etc., and private and industrial service. The Commission has treated these matters in detail in previous decisions and reference is made to the following decisions: *City of Ashland v. Ashland Water Co.* 4 W. R. C. R. 273; *City of Ripon v. Ripon Light & Water Co.* 5 W. R. C. R. 1, 66; and *Christian Dick et al. v. Madison Water Comm.* 5 W. R. C. R. 731, 757.

The city concedes that the peculiar character of the demand or service required by the city for fire protection places this service in a class by itself and renders the general basis of charging inapplicable. The city, however, cannot accede to some of the reasonings and conclusions presented in the *Ashland* and *Ripon* decisions and has devoted considerable space to arguments along this line. A special report by Mr. W. H. Wheeler, in which the Commission's conclusions in the *Ashland Case* are specifically attacked, is made a part of the city's argument in this case. The Wheeler report, in large part, deals with conditions peculiar to the Ashland situation and for this reason is not reproduced herein. The argument of the city contains the principal issues raised by the Wheeler report, however, and these arguments are made a part of the following discussion:

> "The first proposition which the city contends for in this connection is that the charge to the city, which it is the purpose to determine, is the one for fire service or fire protection, and not the charge to the city for both its fire and domestic service. It is the fire service alone that is of the peculiar nature that makes any distinction in the charge necessary. The use by the city of water for schools and other public buildings, fountains, etc., in no essential way differs from the use or demand of other large consumers. The charge for such service can be and should be based on the same schedule that other consumers' charges are."

The city further contends that since the Commission has endeavored to determine what plant or investment would be necessary in order to take care of the city's demand for fire protection, that the inquiry should be conducted throughout on this theory. The city asserts that in the case of the city of Beloit this point is of great moment. The city contends that Beloit has a supply of water for fire protection which a plant designed for this purpose alone could use with but little trouble or expense—the Rock river. In view of this condition the city claims that practically the entire cost of group 2, wells and suctions, and all of group 3, reservoirs and water tank, could be written off and are not to be considered in estimating the cost of a fire protection system. Further, the city contends that only one station would be required, the east side steam plant, and that the west side and electric stations could be deducted. The city would also exclude the greater part of the value in horses, wagons and miscellaneous, and in tools, implements and machinery, and also some part of office furniture and appliances and stores and supplies. Proceeding in this manner, by excluding all items and portions of items, which the city contends would not be necessary in a system for fire protection only, the city arrives at a total deduction of $79,008, from the staff's present value as the portion of the investment necessary for uses other than that for fire protection. The city then finds that $86,434.24 of the staff's present value should be charged to domestic service alone. By further computations the city finds $162,877 as the value of that portion of the property which is to be used in common by both the fire protection and domestic service.

From this point we quote directly from the city's argument on this question, which includes in large part the Wheeler report. Some sections of the argument are omitted, but the essential points are offered herein:

"The next step in the staff's method of determining the hydrant rentals is to arrive at the ratio by which this $165,705 is to be divided between the city and other consumers. In the *Ashland Case* this staff states:

"'It has appeared necessary to work out somewhat upon the hypothesis of two separate plants, one for each of the two divisions of the service, and upon the ratio of their respective pumping capacities to the combined capacity of both.' (p. 294).

"The staff then decides upon a ratio of 69 per cent for the municipal service and 31 per cent for the other. They also state in this connection:

"'These figures are approximately checked by others obtained by somewhat different reasoning. Various water works authorities have given 8 to 15, depending on local conditions, as to the number of simultaneous fire streams to be provided for in cities of 20,000 population. These figures mean supplying from 1,400 to 3,750 gallons per minute for fire fighting exclusively. We have taken for this service in Ashland about 3,000 gallons per minute (although the population has probably not yet reached 20,000). and for the domestic and industrial service about 1,500 gallons. These assumptions show 67 per cent and 33 per cent for the ratios of separate plant capacities to the combined capacity of both.'"

The city then contends that

"These ratios, if they are to be used at all, must be arrived at from the facts of each case. An examination of the Beloit situation shows that the percentage of investment figured on the fire stream basis would be far below 67 for Beloit. In the first place, the population of Beloit proper is approximately 15,000. It is generally given as 16,000, including South Beloit. Of course, the only fire protection that can be charged up to Beloit is that afforded within its corporate limits in the state of Wisconsin. The city itself, in testing the water works system for fire purposes on Feb. 23, 1909, set as a requirement eight simultaneous streams from 1⅛ inch nozzles. The company contended that this was too large a number of streams. Mr. Williams, on page 2 of his report on the fire test of Feb. 23, 1909; gives 1,723 gallons as the amount of water used per minute by the eight streams. An increase of these figures to 2,000 gallons per minute will insure an ample allowance and take care of minor factors which should be considered. On the same page Mr. Williams gives 1,380 as the number of gallons per minute required for domestic and industrial purposes. This estimate is based upon a test made by the company on April 17, 1910. This was made during the season when the weather and temperature conditions were such that the demand would be far from its maximum. It includes no allowance for sprinkling or excessive summer use. In 1909, according to Mr. Lyons' testimony before the Commission Aug. 4, 1910, an appeal from city's ordinance No. 96, the company pumped 685,800,000 gallons, and 5,000,000 would, he stated, be ample to supply all demands for fire fighting purposes. This would leave 680,800,000 gallons pumped for domestic and industrial purposes, or 1,278 gallons per minute for all service other than for fire fighting. This is the average demand per minute, including winter and even nights. In the 2,000 gallons used for the city's demand for fire protection we have got the maximum. It is the same we are trying to arrive at for other consumption. In August, 1908, the total pumped was 71,692,565 gallons. Correcting for the 26 per cent excess reading of the meter at the electrical station, gives the total domestic demand, night and day, under domestic pressure, as 1,380 gallons per minute. Little, if any, water was used that month for fire fighting. The maximum average day demand would greatly exceed the 1,380 gallons. The maximum demand during sprinkling hours on a hot summer day would greatly exceed the average day demand. Placing the maximum per minute demand for domestic and industrial service at 2,000 gallons would seem conservative. Using this figure, would give a capacity demand of each of the two classes of service as 50 per cent for Beloit. With the abnormally excessive pumpage at Beloit, this is under rather than above the domestic demand.

"If this be an approximately correct ratio, then, following the method of the *Ashland* decision, the $167,877 used in common by the two classes of consumers should be apportioned upon this basis. This would give $81,438 to be charged to the domestic consumers, and the same amount to the city, and of the entire investment of $254,497 the city would be charged with $86,624, or a little more than 33 1/3 per cent, and the other consumers with $167,873, or a little less than 66 2/3 per cent.

"This brings us to a condition which would place the present plant and system as none too large for domestic supply, or the capacity demand made by one branch of the service would be equal to that made by the other, and the main system as well as all other portions of the property would, on this assumption, not have to be enlarged for fire protection over and above what they would be for domestic service. As pointed out by Mr. Wheeler in his report on this question, this is likely not far from the case in Beloit. He says:

" 'The situation in Beloit in these particulars seems to be about as follows: When the large consumers are taken into account and the showing of the tests of the hydrants on the upper levels, the system of mains would not seem to be more than adequate to meet the demands for domestic service at the present time. The static pressure at the hydrants varied from 19 to 30 pounds, and with open butt a very marked decrease in pressure was observed, going as low as 7 pounds. By increasing the pressure sufficiently at the pumps, the present system is made to give fire service. This method of raising the capacity by increasing the pressure is not taken into account by the Commission's method, pages 6 and 7. It should be remembered that Beloit has several very large consumers, and any plant outside of its function as a fire engine should be sufficient to take care of such large consumers' automatic sprinkling device in factories, elevaters, water motors, etc., and if these demands are taken into account, the pipe system at Beloit is none too large for private service. Some exception might be made for a few stretches of large pipe recently laid and which form a part of future reinforcing system.

" 'Assuming for the moment that the percentage were not in each case 50 per cent, but 69 and 31 per cent, respectively, is the use made of these percentages a proper one? The total value of the property used in common is charged to the different classes of service using these percentages. That is, it is assumed that the cost or value of the property is increased in exact proportion to the increase of its capacity. This is surely not the case.

" 'To be sure, part of the municipal demand is for water to the schools, but this should not be considered in connection with the capacity estimate based on fire service demand, but should properly be separate matter and distributed to municipal capacity in proportion to use.

" 'The application of the ratio 69 to 31 to the cost of cast iron main is also wrong, for the cost of the mains does not vary as the capacity. Assuming a 4-inch pipe to have a certain capacity, a 12-inch pipe will have nine times as much capacity, whereas the cost is less than three times as great.

" 'I will illustrate from the Beloit pipe line, using the valuation of the staff of the Commission as of Oct. 1, 1908, as being the only one I have before me just now, and it will serve the purpose as well as any other.

" 'The part belonging to class A would be:

Class A.

	Municipal.	Private.
Hydrants	$5,208	
W. I. pipe		$1,098
Valves in same		17
Valve boxes		53
Services, sundry items, lead pipe		5,263
Stopcocks		3,003
Service boxes		1,452
Trenching and laying		9,000
1,432 taps in mains		286
Meters		193
Trenching for W. I. mains		2,194
	$5,208	$22,549 81.2 pct.

Class B.

	Municipal.	Private.
C. I. mains and specials	$63,488	$36,912
Gate valves	1,860	1,113
Gate boxes	504	504
Trenching	42,564	38,245
Boxing under bridge	510	510
	$108,926 *58.5 pct.*	$77,284 *41.5 pct.*
Add class A	5,208	22,549
	$114,134 *53.3 pct.*	$99,833 *46.7 pct.*

"'In the above table of class B I have taken for the municipal plant the present system (assuming that it is adequate) and for the private plant a plant having only four inch cast iron pipe instead of the present sizes, and the same total length, using the Commission's figures of cost for 4-inch pipe and valves, etc., and for trenching. The above is only an illustration and is not strictly correct, inasmuch as in class A the cost of hydrant connections should be counted with the hydrants, but as there is no figure given for this in the staff valuation, I have not included it. In the *Ashland Case*, assuming the capacities to be 69.31 and applying this to the cost of a 4-inch pipe for private service, then the capacity of a pipe for municipal service would have to be 2.226 times as great, which would require a 6-inch pipe, and the relative cost of a 4-inch and 6-inch laid in the ground would not be far from 1:1-3 or 43.5 per cent and 56.5 per cent, respectively, instead of 31 per cent and 69 per cent.' (Wheeler's Report, pp. 1-2)

"This statement of Mr. Wheeler's makes very apparent the incorrectness of the results arrived at by using this rule. Even though the method of arriving at the ratio be accepted, the reason for concluding that any or especially all parts of the property will, in order to meet the agreed demand, have to be increased or enlarged the exact per cent that the city's capacity demand exceeds that of private consumers, and that the cost of such enlargement is exactly or even approximately the cost of that property used for private service increased by the same excess per cent of the public capacity demand over that of the private demand, does not appear. That large machines cost more than small ones in approximate proportions to the excess in the size or capacity, is not true. That a building necessary to house a water works machinery for private service would have to be enlarged 40 per cent or increased in cost 40 per cent in order to also take on a city service which exceeded a private service by this per cent, does not at all follow. That such would not be true in the case of mains, has already been made clear by Mr. Wheeler. Especially would there be no proportionate increase in cost where the additional demand is largely met by raising pressure to a point far in excess of that maintained or needed for private service and thus increasing the carrying capacity of the mains without in any way increasing their size. This is what is done in Beloit, as before pointed out. It is submitted that the proper method of arriving at the additional cost would be to take each item of the property and consider it separately and determine for it just how much, if any, added expense would have to be incurred in order to make it such as to meet the supposed excess demand for fire service. This fact would greatly affect the conclusions of this question and should not be ignored.

"But a most serious objection to the method used in the *Ashland* decision is the using of the ratio of 69 : 31 not only for the purposes just discussed, but in also distributing the operating expenses between the city and private consumers. It is stated that '$37,579.98 of the cost of furnishing service last year, was not due to the output but must be considered as a fixed or capacity expense. In other words, independent of the cost of the water actually pumped, the respondent company served the city and private users at an approximate cost of $37,579.98. The question now arises, what is the most correct way of determining the city's share of this fixed expense? In this respect there is probably no safer basis of apportionment than the investment.' (p. 292.) The city is then charged with 54.5 per cent of this $37,579.98. The city here strenously urges that this method be not followed in this case. It is believed that the items making this expense should each be considered by themselves in order to determine which are made necessary or influenced by the city's demand for service, and to what extent. Admitting that the percentage of the total investment charged to the city be correct, the character of the service is so radically different that it does not at all follow that operation costs chargeable to the two services are in proportion to the part of the plant devoted to each. If the investment demanded by the city be assumed to exceed that required by private consumers, it is a fact that the consumption by the city for fire purposes is insignificant as compared with that of other consumers. For Beloit in 1909, according to Mr. Lyons, it was 680,000,000 gallons for private as against 5,000,000 gallons for fire fighting. It is stated in that portion of the decision quoted above that the expense in question is independent of the amount of water consumed. It is clear that such is not the case, for this very expense would surely have been greatly reduced if but 5,000,000 gallons were pumped instead of 685,800,000 gallons. Another fact that must be considered here is that the expense in question is dependent also on the number of consumers. This is one of the prime causes of the expense. In Beloit there are approximately 1,700 private consumers and the city would constitute but one and uses but 1-137th of all water pumped, yet it would be under the *Ashland Case* charged with 54.5 per cent of all this expense. This expense is made largely by the amount of water sold and the number of consumers.

" 'The plan of the Commission to base the charge of the city on the percentage of total capacity adapted to municipal service and prorating the capacity part of the operating expenses in accordance therewith, as shown in the *Ashland Case*, on pages 290 to 296, seems to be falacious in many respects. In the first place, the division in table XI, showing 54.5 per cent for municipal purposes and 45.5 per cent for private, if properly worked out, could only hold on the assumption that there is no common use of the capacity of the system, but that the system is made of sufficient capacity to serve private consumers, and that to this is added a sufficient capacity to afford fire protection independently of this private capacity. In other words, it is assumed that private consumption and fire consumption will both be at their maximum simultaneously. Otherwise there is no excuse for assigning to one consumer 54.5 per cent of the capacity expense. But the above assumption of simultaneous demand is not true, for the sprinkling service forms a very large part of the private demand, and this is confined to a small part of the day, and is entirely prohibited in case of fire.' (Page 1.)

"He might also have added a still more important fact, and that is that the system is supplied with shut-off valves in the mains, so that large sections, in fact practically all the city, can be prevented from taking water for private purposes during a fire. The entire Fairbanks-Morse Manufacturing Company's supply is shut off in emergency cases. The right is reserved and exercised to discontinue not only sprinkling service, but practically all private service in case of fire. Mr. Wheeler continues:

" 'Taking the Beloit case, then, I would think that the way to arrive at the proper relative amounts of municipal and private revenues of the plant would be as follows: Any class of municipal service which can be metered or estimated by flat rate should be upon the same basis as the private service. This leaves only the question of the amount of hydrant rental to be considered, and this would be affected largely by the excess cost of the plant which would be required over what is necessary merely for domestic use.

" 'Taking the plant as it is, we do not find any large excess in the pipe line. The cost of the hydrants and connections are all chargeable to fire service. I have shown in my previous report that a single pumping station properly equipped could be operated more cheaply than the present multiplicity of stations, and think we have a right to figure the extra cost of plant made necessary by fire service from the single station standpoint. This would involve no extra stand-by charge, as the plant must be operated continuously for domestic service. A certain percentage of increase in pump capacity and water supply must be allowed.' (Report.)

"Then follows that portion of Mr. Wheeler's report which has already been quoted. It is also material here, but will not be inserted, as it can be read on a preceding page. He then continues:

" 'We have, then, as the extra equipment and expense pertaining to the fire engine feature of the Beloit system the following items:

Hydrant and connections, say	$7,000 00
No. 4 large pump, etc., connected, say	2,000 00
Wells. ⅛ of total, say	4,000 00
Reservoir, say	6,000 00
Buildings and sundries, say	1,000 00
Boilers and connections, 50 per cent total, say	2,000 00
Pipe line (excess cost of all pipe larger than 8-in), say	8,500 00

Office furniture, etc.	None
Tools, etc., say	300 00
Horses, wagons and miscellaneous	50 00
	$25,850 00
Twelve per cent.	3,102 00
	$28,952 00
Stores and supplies, say	500 00
Paving, say	1,000 00
	$30,452 00

"'This shows that about 12 per cent of the property at Beloit is chargeable to the municipal branch of the service for fire purposes, and it shows the rest of the system is common with all other consumers.

"'Suppose the city should pay the company this $30,452 in cash, they would then be chargeable only with the cost of water served from fire hydrants, with profits added, the same as any other consumer, making allowance for the extra cost of furnishing water under fire pressure, and for any other cost specially incurred for the fire service.

"'In place of paying this $30,452, the city might pay a yearly amount equal to the interest and sinking fund on this $30,452, and depreciation on the property it represents. The interest, at 6 per cent, would be about $1,800 and the sinking fund about $1,500, and depreciation, at 1 per cent, about $300, making a total of $3,600, to which should be added the charge for service. If the city uses 10,000,000 yearly from fire hydrants, this, at 10 cts. per 1,000 gallons, would be $1,000, making a total of $4,600 for hydrant service, or $25 per hydrant. All other municipal service should be by meter or flat rate estimation.' (Wheeler's report, pp. 7–9.)

"Under the latter method suggested by Mr. Wheeler, the city would, in the course of years, through the payment of the $1,500 annually for a sinking fund, own that portion of the plant made necessary by its demand, or at any rate have paid for it, and should thereafter be charged only the cost of the water and profits. Should the company make this added investment instead of the city, then the rentals to be paid would be $3,100, instead of $4,600, a year.

"Now, why is not the argument of Mr. Wheeler sound and his method the proper one to use? By it the company is fully compensated for all extra and ordinary investment made necessary by the fire service, and is also paid for all product it sells. Every requirement made by the city in this respect has been met. To say that they are required to make the investment for fire service given in the *Ashland Case*, is clearly not in accord with the facts. If not, why should this one consumer be made to bear such a load? The only way in which the city, as a consumer, differs from any other large consumer is that it requires a special and added investment not required by others. Now, when the fixed charges, including profits on this added investment, have been paid, and the costs and profits of the product used have been paid, the entire duty of this branch of the service or consumer has been discharged. The charge per gallon for the water consumed should include the proportional part of the fixed charges of the entire plant. This will then take care of the common usage by both classes of the service. In other words, after the special investment made necessary by the fire service has been taken care of, the city should in every respect be treated as any other consumer. Eliminating this one feature of added investment, it in no way differs from other consumers, and its rates should otherwise be based upon the same basis and arrived at in the same way.

"If the charge to be made to the city is to be arrived at by basing it upon an investment that would be necessary for it were no other consumer served, why should not every consumer's charge be arrived at in the same way? Take a party who has a house one mile from the wells or pumping station. In order to serve him there will be necessary one mile of, say, two-inch main. There would also have to be a well, land and pump, etc. Also an expense for fuel, an engineer and all other items of expense. Compute the rate chargeable to him on this basis, and the result will be as amazing as it is in the case of the city, which uses but 5,000,000 gallons of water a year. If the method in question be the proper one to follow in Beloit, the city's bill for fire protection should be at least borne one-half by the larger factories, who not only are at present consumers buying fire protection through sprinkling systems, but their regular fire hydrants on their premises, for which they pay an agreed amount to the company. Take the Fairbanks-Morse Manufacturing Company. They have acre after acre of buildings, all practically as one. They have a great fire hazard. On their private grounds, connected with their private mains, but supplied by the water company, are a large number of fire hydrants. The maximum demand by this company for fire service is fully as great as that of the city, even in the business section. The eight fire streams simultaneously flowing, adopted by the city as a fair maximum demand by it, might at any time be required and used at this consumer's plant in fire fighting. Yet the water company for years has been furnishing this concern with all these hydrants and standing ready to meet this maximum demand, and also selling to it for domestic and industrial purposes about one-third of all the water pumped for an annual charge of but $2,700. Under the *Ashland* decision, the city is required to pay the 54.5 per cent of the revenue because its demand for fire service was made by it alone. But in Beloit we have a consumer other than the city, who makes an equal demand for the same purpose. We have other factories, which for fire protection as private consumers also make great demands. Therefore, the reasoning of the *Ashland Case*, admitting it to be proper, fails when applied to Beloit and its local condition.

"It seems hardly reasonable that the company would sell this fire service to these companies at rates that are ridiculously low, as compared to the cost as figured in the *Ashland Case*, if the service actually cost what it is there stated to cost. Nor would those who put in the Beloit plant and had the establishing of rates practically in their own hands have put the charge of this service to the city so far below its cost. The city believes that the amount at present being paid by the city is grossly in excess of what it should be, and that the hydrant rentals recommended by Mr. Fowle in his report are even in excess of what they can be placed at when the proper theory and method is used and local Beloit conditions are given due consideration."

We have quoted freely from the city's argument in this matter, as we believe certain questions are raised therein which merit serious consideration in this connection. The consideration of the questions thus raised by the city is taken up in the following memorandums and apportionments submitted by the staff, and in the apportionment of the water department expenses. Although the staff has, in previous decisions, submitted memorandums covering the matter of apportionment of values between public and private service, it has been decided to reproduce herein further memorandums bearing more directly upon the matters involved in these proceedings. The following memorandum submitted by the engineering staff of the Commission discusses the matter of apportionments in a more general way, the computations and statements regarding the particular Beloit situation following:

Apportionment of Values of Water Works Plants

between public and private services.

Submitted Feb. 25, 1911.

"Prior to this time the engineering staff has made apportionments of the values of three Wisconsin water works plants between public service on the one hand and domestic and industrial service on the other. Public service has heretofore been taken to include the furnishing and use of water for fire fighting, street sprinkling (except where a separate charge is made and collected for this service), sewer flushing, and the supply of public buildings and fountains, including schools, city hall, fire and police stations, etc.

"A decision was very recently made that in the future the property values be divided between fire service exclusively on one hand, and all other services on the other, thus classing the service of sewer flushing, street sprinkling, supply of public buildings and fountains along with domestic and industrial service, which are fairly regular or may be estimated with reasonable accuracy.

"In the past these apportionments have been based upon the relative values of two independent plants assumed to serve the two divisions of the business separately. Most water works throughout the United States have been designed and constructed to furnish both fire protection and private service. A considerable number, however, were built to serve only one or the other. The Manual of American Waterworks for 1897 (no later edition published) shows that at that time there were in the United States 3,196 water works plants furnishing both kinds of service, in addition to 207 works furnishing only domestic or private service, and 108 plants furnishing only fire protection. Thirty-five of the latter number were in the north central states, namely Ohio, Indiana, Illinois, Michigan, and Wisconsin, five of these plants being in Wisconsin.

"In plants furnishing both kinds of service there are obviously some items the investment in which is chargeable wholly to one kind of service or the other, e. g., hydrants, service pipes (where there are included in the valuation owing to the investment in same being made by owners of the plant), small wrought mains on which there are no fire hydrants, etc. In some cases there are other items coming in the same category, as, for example, a special fire service pump operated only in case of fire, or items serving private consumers alone. Such items have, for convenience in previous apportionments made by this staff, been designated "Class A property." The remainder of the property, including all items used in common by both kinds of service, has been termed. "Class B property."

"It appears that the latter group of items includes all upon which there is likely to be a difference of opinion as regards the correct treatment in apportioning the plant value, and it is, in general, considerably larger in amount than class A.

"It will generally be conceded that the capacity of such waterworks should be nearly, if not fully, sufficient to meet the combined maximum demands of both fire and private service. In general there will not, or should not, be any sewer flushing or street sprinkling at such time. It is sometimes said that on account of the improbability of a combination of the maximum demands of fire and private service, due to the improbability of the occurrence of a large fire during the hour of heavy domestic use of water, the capacity of the works need not be fully equal to such emergency. That question need not be argued here, as the problem is the apportionment of the equipment which the plant actually has, and both branches are entitled to share in any shortage of surplus of capacity, or investment.

"If there is not sufficient capacity in the plant to meet the combined maximum demands of fire and private service, any intelligent and energetic manager or superintendent would, in such an emergency, shut off a part of the domestic service by closing, or partly closing, certain valves in the mains. Therefore, if one division of the business should take precedence over the other, it is the fire service. To say that a given system has a capacity sufficient for only one division of the business and that, owing to a lack of sufficient capacity for both, there is little or no investment in the system chargeable to the other branch of the service, does not appear to be sound reasoning.

"Bearing in mind the fact that the water for fighting a fire is taken from a single hydrant or a small group of hydrants near the fire, it will be evident that those fire service mains most remote from the plant must have large capacities as compared with the sizes of mains required in the same localities for the adequate service of private consumers alone.

"In making analysis of conditions for apportionment of water plants, the private consumption of water must in general be assumed to be distributed over a system about as uniformly as are the consumers. It is then easily shown that for any given line of pipe on the outskirts of a distributing system the fire service furnished through it will, in general, call for much more water carrying capacity than will the private service furnished along the same line.

"In apportionments previously made by the staff it has been recognized that increases in diameters of mains do not increase unit costs as rapidly as carrying capacities. The costs per foot of 2", 3", 4" and 6" mains were, in one valuation made by this staff, 29c, 43c, 61c, and 82c, respectively, these figures being in the ratios 1, 1.48, 2.1, and 2.83, while their capacities, figured on the same losses of pressure in ft. head per 1,000 ft. of line, are in the ratios 1.0, 3.0, 6.6, and 20. The prices quoted above for 2" and 3" pipe were for galvanized wrought pipe, while those for 4" and 6" were for standard cast iron pipe, all laid in the ground complete.

"If we consider separately the apportionment of, say a 6" main on the outskirts of a system, which main furnishes both fire service and domestic service to the few private consumers along that outlying main, there being in general several such cases in any system, we are likely to find that a 2" pipe would be amply large for the domestic demands, but the furnishing of only two good streams or, say, 350 gals. per minute at the last hydrant, for fire service, with a loss of pressure not exceeding 14 lbs. in 1,000 ft. of line, will require a 5" pipe. Five inch is not a standard size, but by interpolation between the values of 4" and 6" main as given above, its value would be about 71 cts. per foot. Dividing the costs of the 2" domestic service main and the 5" fire service main each by their sum, the percentages of the value of the actual 6" main chargeable to the two divisions of the service are obtained, as follows:

Domestic service .... $\frac{29\text{ cts.}}{29\text{ cts. plus }71\text{ cts.}}$ ....equals 29%

Fire service .... $\frac{71\text{ cts.}}{29\text{ cts. plus }71\text{ cts.}}$ ....equals 71%

"Frequently other parts of the system can be analyzed in a similar manner, and the percentages of the value of particular mains in the system which are chargeable to the two classes of service will likely be found to vary considerably. The percentages for the entire system will, however, quite certainly lie between the percentages determined for the mains nearest the pumping plant and those most remote. The location of the plant with respect to the center of distribution will affect the results to a considerable extent, since this determines the proportion of the whole private service which is to be carried along with the fire service, which, in general, will be the same for any direction from a centrally located plant.

"It may be worth while to consider here also the apportionment of the principal main leading from the pumping plant. Unless the plant be centrally located, the principal main may extend for a considerable distance from the station before branching into a network of distribution lines.

"Let it be assumed: that there is a considerable length of, say, 12″ main leading from a direct pressure plant serving a city with a population of, say, 13,000; that by the character of the city or by the franchise requirements concerning tests of the plant, the reasonable fire service demands are fixed at 8 streams which will throw 160 gallons per minute each; that the ordinary daily consumption for other purposes averages 1,600,000 gallons per day with an ordinary daily maximum rate of 4,000,000 gallons, or 166,600 gallons per hour.

"The above rates in gallons per minute are as follows:

Fire service, 8x160......................................equals 1,280

All other services, (maximum) $\frac{4,000,000}{1,440}$ ....equals 2,780

Combined maximum demands.......................... 4,060

"The actual 12″ main leading from the plant will carry 4,000 gallons per minute with a pressure loss of about 35 feet head, or slightly over 15 lbs. per 1,000 feet of line.

"The size required to carry the maximum demands of fire service and private service separately, with the same efficiency as given by the 12″ line carrying both kinds of service, are 8″ and 10½″, respectively. In the valuation from which the unit prices previously quoted for 2″, 3″, 4″ and 6″ mains were taken, the values per foot of 8″, 10″ and 12″ mains were $1.07, $1.37 and $1.71, respectively.

"In this case the percentages to be applied in apportioning the value of the main in question, based on the costs of 8″ and 10″ mains for fire and private service, respectively, are as follows:

For fire service .... $\dfrac{\$1.07}{\$1.07 \text{ plus } \$1.37}$ .... equals 43.8%

All other service .... $\dfrac{\$1.37}{\$1.07 \text{ plus } \$1.37}$ .... equals 56.2%

"If the principal main then branches into two lines running in opposite directions, to serve two approximately equal divisions of the city, and the two parts of the city have about equal fire service requirements, the domestic and industrial service carried by each of these two branch lines will be approximately one-half the total private service demands, having a maximum rate of approximately 1,400 gallons per minute. It must be assumed that the maximum fire demands of the city may occur in either direction from the works, if the latter be centrally located, hence the two branch lines should, under the conditions of the typical case here assumed, be apportioned approximately one-half to each of the two divisions of service, on account of the approximate equality of the maximum fire and private service demands in either direction.

"Another consideration which must be kept in mind in apportioning any distribution system is the fact that the small wrought pipe mains commonly found on the outskirts of a water system are supplied by the larger cast iron mains which in these cases act as feeder mains. Owing to the complexity of the problem, it is usually very difficult, if not impossible, to analyze conditions attending mains in the network between the main arteries of the system near the plant and the lines on the outskirts of the system.

"The determination of the final percentages which are to be applied to the entire cast iron pipe system becomes to a certain extent a matter of judgment, having the limiting percentages determined by such analysis as are discussed above.

"It is readily seen from the foregoing that these apportionments of water main systems have been based upon the relative *costs* of separate systems for the two general classes of service and not upon the relative *capacities*. Had the latter been the basis, still larger percentages of the entire actual system chargeable to fire service would have resulted. In the case of the outlying 6″ main assumed and discussed above, the relative capacity of 2″ and 5″ mains for separate fire and private service systems would give the following percentages for apportioning the value of that line in the actual system,—the relative carrying capacity of a 5″ pipe being 12.1 as compared with that of a 2″ line:

2″ private service main $\dfrac{1}{1 \text{ plus } 12.1}$ ....equals 7.6%

5″ fire service main $\dfrac{12.1}{1 \text{ plus } 12.1}$ ....equals 92.4%

"In regard to basing the foregoing computations on a 2″ line for private service alone, it should be explained that it is certain that a pipe of that size will carry without undue loss of pressure the amounts required by the consumers in two or three blocks of any such residence districts as are usually found on the borders of a waterworks system, especially since the consumers are scattered along the line considered, and the rate of flow in the pipe, even in time of maximum demand, will continue to decrease to a very small rate at the last service connection, so that in the typical case discussed above, it is felt that private service is favored, rather than fire service.

"It is, of course, to be remembered that individual plants frequently have peculiarities of their own, and the circumstances and conditions in each case must be given special attention.

"What has been said herein has been with special reference to direct pressure plants. The conditions and analysis discussed above will be modified somewhat in the cases of stand-pipe systems, both by the special features of these plants and general methods of their operation.

"It is also to be remembered in making apportionments of the values of water plants between fire and all other service, that unless the assumed separate plants are similar to the actual plant in their general features or design, the ratio of their operating expenses may be disturbed and their costs of service may not be correctly gauged by apportioning the operating costs of the existing plant. This important consideration has been recognized in previous apportionments made by the staff.

"Apportionment of Physical Value of Power Plant Equipment Between Fire and All Other Service. Special Reference to Beloit Water, Gas & Electric Company's Plants.

"In a great many water works plants special fire pumps are installed and used for fire service only, while in other plants the same pumps are used for both fire and domestic service. In apportioning the power plant equipment between fire and all other service, equipment that is used wholly for one branch of the business is charged to its particular branch, while the boilers which are used in common for both branches are divided in proportion to the maximum steam consumption. The demand on both branches of service considered at a maximum.

"In plants like the one at Beloit, where all branches of service are supplied by the same pumps, the pumps are divided on the basis of maximum pumpage for each branch of the service, all service being considered supplied under fire pressure. The reasons for this basis of division are as follows:

"(1) When a common distribution system is used to supply both fire and domestic service, all service is supplied under fire pressure during a fire.

"(2) In the case of Beloit the type of pump used is no doubt the same as the type that would have been used had two plants been built, one for each branch of service. This being the case, the cost per unit of capacity is the same for each branch.

"(3) It is true that a standpipe affects the cost of operation of a plant, but in a system such as Beloit, when a fire occurs the standpipe is cut off, and the capacity of the plant must be sufficient to supply both the fire and domestic service at the same time.

"(4) During the time of a fire there is an advantage to private consumers in having fire pressure on the domestic services. This allows sprinkling the house, etc., in case there is danger of the fire spreading.

"The boilers at Beloit were divided on the same basis as the pumps, as the steam consumption per unit of capacity would be the same for both branches of service during the time when fire pressure is on the system.

"It is impossible to follow a set rule in apportioning the physical value of the power plant equipment of a water works. Each plant must be considered with reference to design, method of operation, etc.

Apportionment of Water Works Property Between Fire and Other Service, Beloit Water, Gas & Electric Company (Distribution System and Water Supply)

"One of the special features or peculiarities of the Beloit water works is the fact that there are three separate pumping stations, operated by three separate kinds of power, and feeding or supplying the distribution system at three rather widely separated points. This situation is the development of many years. Originally a single pumping station, the east side steam plant supplied the city from 1885 until about 1901. About the latter year the hydraulic power pumping plant on the west side of the Rock river was constructed and put in operation. A number of circumstances and considerations are conceivable which may have caused the construction of the plant and fixed its location. Among these are: A saving in fuel for pumping by reducing the amount of water pumped by steam power; an opportunity to make a possibly advantageous purchase of an idle building formerly used as a mill, and to which property belonged water power rights; and it may have even appeared advisable to supply the distribution system from independent plants on opposite sides of the river, for sake of a certain practical continuity of service on both sides, even in case of a break in the river crossing main, such mains being usually in greater danger of breaks than any others. It is even a reasonable question as to whether or not the construction of that plant actually avoided reinforcement or some changes in the form of the distribution system. It is not improbable that an equally adequate system of mains supplied by a single plant instead of the three now in service in Beloit would differ materially from the existing system, at least in its main arteries.

"The construction of the third station with electric motor driven centrifugal pumps is a development of every recent years and this, too, must be assumed to have been prompted by good business reasons. Whether or not the second and third plants actually avoided changes which might otherwise have become necessary in the distribution system, is a not altogether pertinent question. The existence of three plants undoubtedly has its effect on the efficiency of the present system, and consequently on either the cost of service or its character.

"In apportioning that part of a distribution system used in common by both fire and domestic service (including in the latter class all service other than fire fighting), which part is usually cast iron mains, exclusive of hydrant branches and hydrants, it appears proper to do so on the basis of the ratios of the costs of separate systems to their sum. The value of cast iron mains in this case, excluding hydrant branches and all items used by domestic consumers alone, is $121,477 new, and $119,555 for existing condition.

"The determination of ratios by which the above values should be apportioned between fire and all other service becomes the next step.

"An examination of the company's pumping statistics shows that the water consumption in Beloit varied, during the calendar year 1910, between 916,000 gallons on Feb. 20, (Sunday) and 2,873,000 on July 8, and it appears that no fire was reported to the state fire marshal as occurring in Beloit on that date. The four largest figures for daily pumpage and their dates are as follows:

June 30,	2,821,000	gallons
July 1,	2,792,000	"
" 7,	2,832,000	"
" 8,	2,873,000	"

"Small fires were reported for June 30, and July 1, causing damages reported as $73 and $55, respectively, the smallness of damages indicating that very little, if any, water had been required therefor. The use of water on July 8 amounted to an average of nearly 2,000 gallons per minute throughout the 24 hours. It is hardly to be doubted that during some period of that day the rate at which water was being used reached, if not exceeded, 3,000 gallons per minute, or a rate of 4,320,000 gallons per day, for domestic and industrial service alone.

"The reasonable fire service requirements, as outlined by the city's fire chief in advance of a water works test held Feb. 27, 1909, were eight streams from four hydrants, each stream to be taken through 250 to 300 ft. of fire hose and a 1⅛" smooth nozzle, and to reach a height of 75 ft. in still air. Those streams would be throwing approximately 1,800 gallons per minute. It was estimated from pressure observed at the hydrants during the test referred to, and from other data, that the discharge of the eight streams varied around 1,725 to 1,750 gallons per minute. In that test the pressures observed at one of the four hydrants were decidedly lower than prevailed at the others, and the fact appeared to be due to improper connection of that hydrant with the main. Doubtless the circumstance accounts for the fact that the eight streams did not appear to be throwing the full 1,800 gallons per minute at any time. It is understood, however, that the defective hydrant connection has since been properly remedied. It is probable that in a repetition of the test, all other conditions being as before, the eight streams would be throwing the full 1,800 gals. per minute. The city has, in its arguments, assumed that a water works capacity to pump and distribute 2,000 gals. per min. for fire service is ample, and should be used in the computations instead of 1,800 gallons, in order to cover other factors which must be considered. In regard to the resonableness of these requirements for fire service it may be said that it appears from examination of reports upon different cities by the National Board of Fire Underwriters that about 4,000 gallons per minute would probably be the amount considered by them as the quantity of water which should be provided in Beloit for fire service alone. It appears that no report upon Beloit has been made by that board. The following is quoted from their recommendations contained in one of their reports upon a neighboring city of about 20,000 people:

"'*Mains*

"'5. That the water company adopt and follow for all future construction a plan for a distribution system having well designed main arteries and secondary feeders, which allow for future growth and the relative fire hazard of the districts, so as to obtain fire protection supply as follows:

"'a. In residential districts a minimum of 2,000 gallons per minute.

"'b. In the principal mercantile and manufacturing districts a minimum of 4,000 gallons per minute.

"'The above quantities to be in excess of domestic consumption and to be available in manufacturing districts about any large building or group of buildings of special hazard, and in mercantile and residential districts about any block, at a pressure during such draft of not less than 80 pounds in mercantile and manufacturing districts and 60 pounds in residential districts.'

"It appears that similar recommendations have been made by the same board in reference to cities even smaller than Beloit.

"The amount of water which the fire department of a city is ordinarily equipped to use is regarded as a circumstance worthy of consideration in determining the quantity which should be provided for fire service.

"It does not appear equitable to apportion the Beloit water system on the assumption that 4,000 gallons per minute should be provided for fire service alone. The large difference between the quantities called for by the city's own specifications for a test of the plant and by the National Board of Fire Underwriters makes the city's demands seem modest. The recommendations of several eminent engineers have the same tendency.

"It may be claimed that the better the fire protection the lower will be the insurance rates, but it is equally true that at least some of the saving in insurance premiums must be paid out in increased cost of hydrant rental and fire department expenses.

"It is assumed in apportioning the plant value that the reasonable maximum fire service demand which may be made on the Beloit water works at any time is 2,500 gallons per minute.

"*Simultaneous Demands of Fire and Other Service.*

"It has been stated by various writers on water works matters that, owing to the improbability of a large fire occurring during the hour of maximum domestic demand, it is safe to discount somewhat the sum of the maximum demands of fire and private service in arriving at the requisite capacity of a water plant and system. One objection to such discounting is that the large fires which cause the maximum fire service demands frequently last for many hours, overlapping the time of heavy domestic use. The propriety of such discounting would seem to depend upon whether or not the domestic use of water was materially greater on summer evenings, on account of general lawn sprinkling, than during any other hours of heavy use. It does not appear to be generally true that the maximum domestic and industrial demand occurs on summer evenings through lawn sprinkling.

"Another objection to the discounting the combined maximum demands is that under the higher pressure generally put in a system during fires the domestic and industrial use of water is largely increased, a fact which does not appear to have been taken into consideration by those who would make such discounts from combined maximum demands. This increase in domestic use under fire pressure may be and has in some cases been checked by closing or partly closing certain valves in the system to reduce the supply to districts not endangered by the fire. But such step is apt to be adopted in many cases by those in charge of the water plant only after a fire gets beyond control and threatens to become a general conflagration. Timely restriction of domestic use of water during fires is hardly to be regularly counted upon in designing plants and pipe systems.

"The increase in domestic consumption resulting from the increase of pressure for fire service is due to the combination of fire and private service into the business of a single plant. If this increase in the rate of use of water means additional pump and pipe capacity, it means extra investment and the latter is not fairly chargeable wholly to either fire service or private service, but is to be shared by both. That division would be accomplished by apportioning property values on the basis of ratios derived from demand rates and capacities, excluding the extra rate resulting from increase in pressure.

"The percentages used in apportioning the cast iron mains supplying both fire and domestic service were determined from the foregoing considerations and from the fact that the fire and private service demands are very differently distributed over the system. All the mains on the borders of a pipe system could be of small diameters for domestic service as long as the quantities to be carried diminish to a relatively very small amount at the last service connection in each direction. For fire service alone in the same places a pipe smaller than six inches in diameter would frequently be inadequate, especially if of considerable length. Even in cases where the maximum fire demand in cities of the size of Beloit is less than the maximum total demand for all other service, the difference in distribution will show that more than one-half the value of the common system is chargeable to fire service. In this case 60 per cent of the cast iron mains charged to fire service appears to be equitable.

"*Water Supply and Storage.*

"The values of the investment falling under these headings are in the wells, reservoirs, standpipe, and the piping between these features and the pumps. The construction of the reservoir is strong evidence in itself that the wells alone could not be relied on to furnish water at a rate equal to the combined demands of fire and private service. The function of the reservoir, being to help out in time of heavy demand on the wells, seems to. in a measure at least, require the same division of the values of these items between the two main divisions of the service. The elevated tank (sometimes termed standpipe), has a double function. It serves to regulate the normal pressure in the system and reduce the otherwise inevitable and frequent fluctuations in the pumping rate, also it is a storage tank with a capacity of about 30 per cent of that of the reservoir, as pipe connections to it were so made that it could be shut off from the system in case of fire. and the water contained in it could be drawn off and repumped directly into the system under fire pressure. The latter function justifies to some extent the apportionment of its value in the same way as the wells and reservoirs; the former alone would lead to the charging of its value to investments for service other than fire fighting.

"In regard to the capacity of the wells with respect to the maximum demands for water, it may be said here that during the fire stream test of Feb. 27, 1909, the output of the three pumping stations appeared at times to aggregate approximately 4,500 gallons per minute, after allowance is made for the 26 per cent excess reading of the station meter in the electrical pumping plant. Of that 4,500 gallons per minute nearly 1,100 per minute were taken from the reservoir, leaving about 3,400 as supplied by the wells. This rate of output was determined by the demand and not by the capacity of the well supply, which was taxed to its limit during that test. It is apparent that, so far as water supply or yield of the wells is concerned, the service other than fire does not now require either the tank or reservoir to help out the wells, and it may even be that domestic and industrial service alone does not require all the wells and piping from them. It is, therefore, obvious that practically all of the investment in items falling under groups 2 and 3 of the engineer's property classification cannot equitably be charged entirely to domestic and industrial service.

"It is conceded that a water plant or plants built in Beloit for public fire service only would undoubtedly take its or their water from the inexhaustible supply in the Rock river, and the necessary cost of the intake or intakes, would be small in comparison with the values of items in groups 2 and 3 of the engineers' classification of property. It may be, and probably is, true that the investment in these groups is actually greater than the sum of the necessary investments under the same headings for separate plants for the two service divisions. If so, the difference is due to the combination and is not chargeable wholly to one or the other kind of service. There appears no more reason to deduct and charge to fire service such amount as would be involved in pipe lines for getting river water to the pumps, charging the entire remainder of groups 2 and 3 to domestic and industrial service, than to do the reverse, by charging to fire service all that is left after deducting from groups 2 and 3 such items or values as would be required under those heads for domestic and industrial service alone. The extra investment in property groups 2 and 3 necessitated in furnishing for fire protection water suitable for domestic use will usually, if not always, be outweighed by a saving of the difference between the costs of separate and combined distribution systems. Both the economies and extra costs effected by combining fire and private service plants should be shared by those classes of service.

"With this object in view, the value of the elevated tank is apportioned 90 per cent to domestic and industrial service and 10 per cent to fire service. The investment in the wells and suction piping, as measured by the engineers' valuation, is apportioned 75 per cent to domestic and industrial service and 25 per cent to fire. The value of the reservoir is properly chargeable 50 per cent to each division.

"The probable change in the relative demands of fire and private service in the near future has not been overlooked. The previous growth in the business of the Beloit water utility will doubtless continue at a more or less rapid rate, with a resulting tendency toward increased consumption of water. There is undoubtedly a considerable amount of water wasted in Beloit daily, and the extent to which meters are used, together with the general experience as to the effect on consumption of the broader application of meters on any system, indicates a probability, if not a certainty, that some reduction can be made from the present rate of use by restricting waste through the installation of more meters. The net effect of these opposing tendencies can hardly be expected to be large, but only future operating statistics can determine the amount.

"It has been contended by the city that only one of the three pumping stations, the east side steam plant, would be necessary for fire service and the other two plants should be charged to domestic and industrial service. In support of this are the facts that the rated capacity of all the pumps in the steam station is 4½ million gallons per day, or 3,125 gallons per minute, and that the total capacity of all pumps in the other two stations (three separate buildings) is about the same amount, so that it may seem that the plants, if divided in that way, could handle the business of the respective divisions. It may, however, and with equally good reason, so far as maximum demands of the two classes of service and the division of total pumping capacity is concerned, be argued that the opposite should be done,—charge the steam plant solely and wholly to domestic and industrial service.

"If the steam plant be considered separated from the others and charged to either division of the business, the cost of service to that division will include the entire fixed charges and operating expenses of that plant. For fire service it would be called upon to do but little work but would necessarily be ever ready to begin pumping on short notice. Its boilers would have to be hot at all times, thus requiring the continued maintenance of banked fires, involving considerable fuel and continuous attendance, or it would require, as an auxiliary feature, a standpipe or water tower of such height and capacity as to be able to give adequate fire service until fires could be built under the boilers and sufficient steam pressure be raised to enable the pumps to take care of the service. Under such plan of apportioning the property the cost of service would include improper charges for operation.

"It appears more equitable to consider the three pumping plants as a unit in apportioning the property between public and private service, except in the cases of certain minor features, the nature and use of which determine otherwise. The manner of apportioning all items of the water works inventory is clearly indicated in the following tabulation:

	FIRE.		ALL OTHER.		TOTAL.	
	New.	Present value.	New.	Present value.	New.	Present value.
1. Land	$7,411	$7,411	$7,411	$7,411	$14,822	$14,822
2. Wells and suctions	3,695	3,606	11,085	10,817	14,780	14,423
3. Tank and reservoir	4,285	4,115	10,696	9,951	14,981	14,066
4. Distribution system	83 652	81,681	73,996	71,048	157,648	152,729
5. Power plant equipment	12,280	9,353	15,010	11,432	27,290	20,785
6. Buildings and miscellaneous structures	10,532	8,110	12,873	9,912	23,405	18 022
7. Office furniture and appliances	....	....	1,839	1,643	1,839	1,643
8. Tools and implements	465	237	466	238	931	475
9. Horses, wagons and miscellaneous	84	62	83	62	167	124
Total, 1—9	$122,404	$114,575	$133,459	$122,514	$255,863	$237,089
10. Add 12%*	14,688	13,749	16,015	14,702	30,703	28,451
Total, 1—10	$137,092	$128,324	$149,474	$137,216	$286,566	$265,540
11. Stores and supplies	2,353	2,326	1,817	1,791	4,170	4,117
Total, 1—11	$139,445	$130,650	$151,291	$139,007	$290,736	$269,657
12. Paving	270	257	270	256	540	513
Total, 1—12	$139,715	$130,907	$151,561	$139,263	$291,276	$270,170
Non operating	....	....	....	....	....	....
Total	$139,715	$130,907	$151,561	$139,263	$291,276	$270,170
Percentages	*48*	*48.5*	*52*	*51.5*	*100*	*100*

* Addition of 12% to cover cost of engineering, superintendence, interest during construction, contingencies, etc.

	Per-centages.	FIRE.		ALL OTHER.		TOTALS.	
		New.	Pres. val.	New.	Pres. val.	New.	Pres. val.
1. Land	*50-50*	$7,411	$7,411	$7,411	$7,411	$14,822	$14,822
2. Wells and suctions.							
All wells and pipings*	25-75	3,695	3,606	11,085	10.817	14.780	14,423
3. Stand pipe, reservoirs and filters.							
Tank	*10-90*	$801	$729	$7,212	$6,564	$8,013	$7,293
Reservoir*	*50-50*	3,484	3,386	3,484	3,387	6,968	6,773
Total for group 3	....	$4,285	$4,115	$10,696	$9,951	$14,981	$14,066
4. Distribution system.							
Mains 4" and larger, com.	*60-40*	$72,886	$71,733	$48,591	$47,822	$121,477	$119,555
Mains 3" and smaller, complete	*0-100*	....	....	5,038	4,516	5,038	4,516
Services and meters	*0-100*	....	....	20,367	18,710	20,367	18,710
Hydrants and connec.	*100-0*	10,766	9,948	....	....	10,766	9,948
Totals for group 4	....	$83,652	$81,681	$73,996	$71,048	$157,648	$152,729
5. Power plant equipment	*45-55*	$12,280	$9,353	$15,010	$11,432	$27,290	$20,785
6. Bldgs. and misc. struc.	*45-55*	$10,532	$8,110	$12,873	$9,912	$23,405	$18,022
7. Office furn. and appl.	*0-100*	....	....	$1,839	$1,643	$1,839	$1,643
8. Tools and instruments	*50-50*	$465	$237	$466	$238	$931	$475
9. Horses, wagons and misc.	*50-50*	$84	$62	$83	$62	$167	$124
11. Stores and supplies.							
Pipe and specials	*60-40*	$1,606	$1,606	$1,071	$1,071	$2,677	$2,677
Stocks, etc	*50-50*	747	720	746	720	1,493	1,440
Totals for group 11	....	$2,353	$2,326	$1,817	$1,791	$4,170	$4,117
12. Paving	*50-50*	270	257	270	256	540	513

*The estimated cost of a river supply for fire, plus the cost of a well supply for domestic and industrial service alone, is less than the values in group 2. The difference between those figures, also the value of the reservoir, is divided equally between fire and all other service."

The total operating expenses, not including taxes, depreciation and interest, of the respondent's water utility were reported by the respondent as $15,517.42 and $17,679.01 during the years ending June 30, 1909, and June 30, 1910, respectively. With the addition of taxes these totals become $19,016.07 and $21,299.01, respectively. The value of the physical property of the water department as of June 30, 1910, after adjustments and additions to the tentative valuation of Jan. 1, 1909, was found to be about $307,941 cost new, and about $289,521 present value. Calculations of the earning value of the utility, as shown in table XXXVII, found the value at the beginning of 1910 as $301,060, and at the end of that year $322,660. It was pointed out that the general expenses of the water utility were comparatively high. On the other hand, the above physical property valuation does not include any allowance for the water power property, nor for working capital and other legitimate allowances. It is obvious that, computing interest and depreciation at 6 and 1 per cent, respectively, on the present value of the physical property alone, will bring the total cost of service to a figure no lower than the present revenues from the water service. In view of these facts, it is obviously unreasonable and unjust to the respondent to cause a material horizontal reduction in its rates for water service at this time.

The distribution of the burden of expense among the various classes of consumers, however, is not as just and fair as it might be and adjustments are called for, we believe, in this respect. What form and direction these adjustments should take, may be revealed by a careful analysis and separation of the cost of service.

The Commission has defined and described fully the nature of output and capacity and consumer expenses in previous opinions and no space will be given herein to a repetition of these matters. An apportionment of the expenses of respondent's water utility as between output and capacity costs has been made. Such an apportionment shows that for the years ending June 30, 1909, and June 30, 1910, about 55 per cent of the total cost of service, including taxes, depreciation and interest, is properly chargeable to output expenses, and the remaining 45 per cent is largely chargeable to capacity expenses. Certain items can be immediately assessed against either fire service or private service. Among these are maintenance of hydrants, meter repairs, collection expenses, etc.

If, on the other hand, we should consider taxes, depreciation and interest on investment as fixed expenses and all other costs as variable expenses, we find that the situation would be reversed, and the fixed expenses would be greater than the variable expenses. The situation in Beloit, however, is affected by the fact that a large part of the pumping costs is made up of the item electric current purchased, and this item is chargeable practically entirely to output expenses, since the charge is based entirely on the amount of current used which, in turn, depends on the amount of water pumped at the electric station.

It is obvious that since fire service is responsible for approximately 48 per cent of the total investment in physical property in the water utility, then fire service must bear 48 per cent of the expenses which are directly dependent on the investment, namely, taxes, depreciation and interest on the investment. We have in this case taken the difference between the direct expenses and the total revenue as the cost of service due to taxes, depreciation and interest, since, as above explained, the total revenue cannot be reduced. Fire service is then charged with 48 per cent of this difference, or about $11,170.60. Of the total direct expenses, or $17,679.01, we find $144.78 directly chargeable to fire service, and $168.32 directly chargeable to other service. Of the remainder, or $17,365.71, we find 45 per cent chargeable to capacity expenses, which amount, divided on the basis of demand, gives 45.4 per cent, or $3,547.81, to fire service. The total of these three amounts gives as the approximately correct charge for fire protection service under present conditions, the annual sum of $14,863.19. The hydrant rental paid during the year ending June 30, 1910, amounted to $10,524.48.

Inclusive of the water used for fire protection purposes, for sprinkling before street cleaning as at present used by the city, and for sewer flushing, the lump sum of $15,000 per annum is considered a fair and reasonable charge to the city or public for fire service. This amount covers all fire protection service in the city, exclusive of inside sprinkling systems, and includes all outside protection systems, whether at present public or private. This charge covers the system as it now exists. If additional hydrants are placed on the existing system, the city or individual ordering such additional hydrant may install the same at its own expense or return to the company the taxes, depreciation and interest yearly on the cost to the company of installing the same, together with the annual maintenance charges. In the case of extensions it is suggested that the city and the company arrive at some reasonable basis for determining the additional charge for fire protection service which arises when extensions are laid and new hydrants installed thereon. This additional charge will depend on such factors as the cost of the extension, the number of hydrants installed, the probable consumption of water by the new consumers reached, etc. Public buildings shall be metered and shall pay for water consumed at the same rates as domestic and industrial consumers.

The determination of the proper charge to the public for fire service, it will be seen, rests largely upon the matter of investment. The amount of water used has practically no effect on the final result, as the quantity consumed for fire service is practically negligible. Passing to the distribution of the burden between the public, domestic and industrial users of water, we are confronted with a problem whose correct solution rests largely on the determination of the consumption of water by these classes. Unfortunately but little reliable information is available in this instance as regards the use of water by these classes. It is to be noted in this connection, that such ratios and units as may be derived under present conditions are bound to be materially changed when water is paid for under a meter system. It is obvious that whatever rates and adjustments are made at this time must be of a more or less temporary character. Only the reliable information obtained through operation under a more or less universal meter system can furnish really definite and accurate bases for the apportionments and unit costs which supply the foundation for successful and scientific rate making.

It is believed, however, that there are certain facts which should be presented herein and their influence on the proper adjustment of the burden of expense noted.

It appears from the statement submitted by the respondent that Fairbanks, Morse and Co. and the two railroad companies paid during the year 1909 the sum of $4,594.00. Factories and other users paid $1,567.17. Private or domestic consumers paid during the same period $22,494.39. In the same statement we find that Fairbanks, Morse & Co. together with the two railroads used 265,000,000 gallons during 1909, while the pumpage to private consumers and business houses during the same period was 377,100,000 gallons. Stated in another way, it appears from the figures given, that while the Fairbanks, Morse & Co. and the railroad companies and private consumers paid about 11 per cent and 61 per cent of the total revenue, respectively, at the same time the water pumped to the three large users and to private consumers was about 39 per cent and 55 per cent, respectively.

The total cost of service during the year ending June 30, 1910, we have found to be equal to the total revenue, or about $40,951. The reported pumpage was about 710,600,000 gallons, or a unit cost per M gallons pumped of about 5.76 cts. During the year 1909 the water pumped to the three large users was sold at an average rate of about 1.73 cts. per M gallons pumped. The cost of pumping alone during the year ending June 30, 1910, was $11,340.61, or about 1.59 cts. per M gallons pumped. The margin between the cost of pumping alone, and the average price paid by the three large users, is then about 0.13 cts. per M gallons pumped. On this margin of 0.13 cts. per M gallons pumped, then, it appears that the company must rely to obtain from the three large users mentioned their share of the distribution expenses, general expenses, insurance, taxes, depreciation and interest on the investment.

In this connection the city states that:

> "In arriving at a water rate schedule for Beloit, consideration must be given to the fact that there are several large consumers which make things abnormal. This is especially true of three, the Fairbanks-Morse Manufacturing Co., the C. M. & St. P. Ry. Co., and the C. & N. W. Ry. Co. * * * Mr. Fowle estimates that to these three consumers go 296,000,000 gallons a year. Out of a total pumpage of 681,000,000 gallons these three would, therefore, consume 43.5 per cent. The total revenue derived from them is but $4,594, or but 1.55 cts. per 1,000 gallons, which is less than the cost of pumpage, to say nothing of fixed charges or other expenses. That the general public is made to pay rates far in excess of this amount, of course, goes without saying, and that they are obliged to make up the loss, is equally evident. The electric station in eleven months of 1908 pumped but 277,148,600 gallons, or in one year would have pumped in round numbers 300,000,000 gallons. The west side station pumped but 294,385,245 gallons that year. Therefore, either one of these stations, especially the former, can be charged up to these three consumers alone, in addition to the special mains devoted to their use. This does not consider the fact that the company is also furnishing fire protection to this large plant. When this added service is considered, the charge becomes still more ridiculous and discriminatory. When these and other large consumers are made to bear their share of the burden, the ordinary consumer will have a considerable portion of the one he is now carrying lifted from his shoulders."

The respondent makes no denial of the conditions which have been described relative to the large users of water service, but calls attention to the element of isolated plant service and the importance of the large consumers both to the company and the consumers.

Questions of this same nature have been presented in previous proceedings before this Commission and it would seem well to quote from the opinions given in those cases:

> "If it costs more to carry some customers than it does others, may it not be discriminatory to charge all the same rate? It would seem so. At any rate it is not easy to discover really valid arguments to the contrary. While no rates should be higher

than the value of the service for which they are paid, it is by no means certain that it would be fair to levy the same rates on all, regardless of the cost. Such policy, besides being inequitable, invariably tends to discourage large scale consumption. As the cost of production per unit depends very largely upon the amount produced, decreasing as the volume of production is increased, and vice versa, it usually does not require much of a falling off in the sales to so increase the cost of production per unit as to even more than offset all advantages that the small consumers may derive from being placed on the same rate basis as the large consumers. The greater the consumption is, the lower is also the cost of production. Low cost of production, in turn, means low rates. It may be more equitable, as well as better business, to secure low rates for smaller consumers through extensions of the business than by serving them for less than cost, thereby throwing the deficits from this source upon the rest of the consumers. Large scale consumption should, therefore, be encouraged whenever it can be so encouraged in an equitable and legitimate manner. It often happens that it is better, both for the plant and for all of its customers as well, that large quantities of the products should be sold at even less than enough to yield the regular rate of profits upon the same, than that these quantities should not be sold at all. * * * The same rate for all is a term that is often much more beautiful in the abstract than when concretely applied. When it stands for the same rate for all regardless of both the cost and its effect upon the growth of the business, it may be in violation of sound, economic and business theories as well as of public policy. While there may be places where the conditions are such that uniform rates will fairly meet the situations, such places are not frequently met with. From these facts it would seem that it is seldom safe to adjust the rate schedules of a plant without reference to the cost of furnishing the service and without regard to the effect of such adjustment upon the development of the business. * * * Under the law it appears to be the duty of this Commission to take all of these elements as well as the local conditions into account in passing upon any given schedule of rates." *In re Application Manitowoc Gas Co.* 3 W. R. C. R. 163, 174—176.

It is clear that large scale consumption should be encouraged, but that there is great danger and that it quite often happens that rates are put so low as to throw a burden on the other customers, is equally clear.

"There are, no doubt, instances where customers cannot be had at the regular rates, and where it might be good business for the plant and to the best interest of the rest of the consumers to make some concessions in the rates, at least for a limited period.

* * * To put a rate schedule into effect for permanent use, which is so low as to hardly cover the output costs, or that yields so little in the way of revenues as to leave little or nothing for interest, depreciation and taxes, would seem to be out of line with sound business practice, and discriminatory as against other customers.'' *In re Menominee & Marinette Light and Traction Co.* 3 W. R. C. R. 778, 898.

A recent letter from the company states that the consumption of water by the Fairbanks-Morse Co. and the six or seven private consumers located on the same line, for the year ending July 1, 1911, was 181,676,670 gallons. Assuming that the Fairbanks-Morse Co. used 180,000,000 gallons during that period, the revenue from this consumer was about 1.5 cts. per M gallons, or less. Another fact to be noted in this connection is that the present unit cost of pumping is somewhat lower than would be true if a majority of the consumers were on a meter basis, since it is extremely doubtful whether the total cost of pumping will decrease as much under a meter system as will the amount of water pumped.

In view of the facts as regards the unit costs of operation, the present pumpage and the consumption, the revenue received, and other facts, it is obvious that the Fairbanks-Morse Co. and perhaps other large users are at present returning to the company in revenue an amount which is insufficient to meet the pumping expenses alone, to say nothing of the distribution and general expenses and the fixed expenses.

If a company is able to make its private consumers return in their rates for service the entire fixed expenses of the business together with the general or overhead charges and a large part of the cost of production, it appears reasonably certain that any revenue obtained from additional consumers, especially if these users are large scale consumers, it will be remunerative. Again, if private consumers as a class are already bearing the burden of all the fixed expenses, general and distribution expenses and their legitimate share of the pumping expenses, it does not appear that the large scale consumption taken on at a rate which does not cover even the pumping expenses will be of any advantage to the majority of the consumers, nor does it appear that such conditions will ever assist in lowering the costs and eventually the rates. If the other consumers are at present carrying all the taxes, depreciation, interest on the investment and the general and distribution expenses, it is difficult to see where any additional cost to these consumers would come if the revenue from the Fairbanks-Morse supply were discontinued. On the other hand, if this service is made to carry its fair and just share of the burden of the expenses, material benefit would accrue to both the company and the consumers. As the situation now presents itself, it is evident that the Fairbanks-Morse Co. is not only failing to return to the respondent the total cost of pumping the water supplied to that company, but it is also failing to return any of the fixed expenses or maintenance charges on a considerable investment which is used by the Fairbanks-Morse Co. alone. In view of these facts we must insist that the large users of water service in Beloit carry their fair share of the cost of service, and that the private consumers shall not be required to pay a part of the cost of service to these large users.

No charge for private fire protection, as covered by outside hydrants, is considered in our conclusions herein. This charge is made a part of the general charge to the city for fire service. The cost of such private fire protection service, if any, is a matter to be adjusted between the city and the consumer receiving such service. The cost of inside fire service, such as sprinklers, etc., must depend on the conditions and circumstances surrounding such service as rendered. No facts have been presented or questions raised in these proceedings in regard to this particular service, and there appears, therefore, no necessity of passing upon it at this time.

METERING.

One of the strongest and most insistent demands of the city is that the water consumers be placed on a meter basis. "Above all else, the people of Beloit ask that meters be installed." The city points to the abnormally large pumpage in Beloit as evidence of the great amount of water wasted. The company at present has about ten metered consumers out of a total of about 1,682 industrial and commercial customers. Of these ten, eight are residences, one a hotel and one a factory. The amount of water which passes through meters is reported as about 2,264,929 or about 0.3 per cent of the total pumpage.

It is asserted by the city that the present flat rate system is unfair, unscientific, unbusinesslike, and is the source of the plainest and grossest discrimination among the consumers. The reasons given by the city why the flat rate system should be abolished in Beloit are sound and have been recognized by the Commission in previous decisions and need not be repeated herein.

The company admits the desirability of a meter service as opposed to the flat rate system, but the company asserts that the financial problems attendant upon an installation of meters are such that the company should be given a period of years in which to accomplish the change. The company believes that if an adequate minimum bill be established, and if the company be given the privilege of determining which class of consumers shall be metered first, that the change may be made without undue hardship on the interests of the company.

It appears from the report of the company for the year ending June 30, 1910, that a general installation of meters would necessitate the metering of the following services: 1,481 ⅝-inch services, 72 ¾-inch services, 96 one-inch services, one 1¼-inch service, and one 2-inch service, or a total of about 1,651 services. In determining what the approximate cost of installing meters in Beloit will be, it is necessary to give consideration to several elements. It is doubtful, first, whether the metering of those consumers who have no sewer or cess pool connections is advisable or economical from the standpoint of either the company or the consumer. Second, it is much more expensive to install meters for those premises which have no basements than for those where the meter may be easily set up in the basement. Third, the sizes of meters installed will not necessarily conform exactly to the sizes of services given above. In some cases, perhaps a large number of cases, the meters installed will be of a smaller size than the service. The reverse may also be true in certain cases.

Taking in view these and other facts which may influence the total investment required to secure a more or less general installation of meters in Beloit, it is believed that the total sum required to accomplish such an installation will be approximately $16,000 to $17,000.

The additional costs of service which will come with the installation of meters will consist of the cost of maintenance, the cost of reading meters and computing bills, taxes, depreciation and interest on the added investment. If, however, the additional investment is considered as a part of the total amount upon which the rates are to be determined, the last three costs mentioned will be taken care of and provided for in the minimum bill, service charge or meter rate. The cost of maintenance and of reading meters, etc., will depend largely upon the number of readings per year, the care and protection of the meters from injury, and other conditions. Whether these additional costs will be offset by the decreased costs of pumpage due to the meter installation, cannot be accurately determined. That the total pumpage in Beloit will be materially reduced by a general meter installation, admits of no argument. What the amount of reduction will be, cannot, perhaps, be estimated within reasonable limits of accuracy, and the estimates and rates now made must of necessity be more or less of an experimental nature and must be held subject to careful review by the Commission after a sufficient trial indicates the actual effects of the change.

The determination and design of a meter rate schedule for water service encounters many difficulties, chief among which is, of course, the fact that no reliable information exists upon which estimates of water consumption and probable revenues under a meter schedule may be based.

The effect of meters on the consumption of water in Wisconsin cities has been analyzed, and the figures given herein are taken from the 1910 reports of the utilities and include all plants having more than 200 commercial service connections, except in cases where the statistics given in the reports were so unusual as to make it appear certain that they were incorrect.

No. of plants.	Per cent of commercial service connections metered.	Daily pumpage per commercial service connection.
19	Under 10.	818 gallons.
29	Under 25.	734 "
18	25 to 75.	564 "
16	75 to 100.	477 "
3	90 to 100.	470 "
8	100.	474 "

The above figures are presented more to denote the effect of metering upon the consumption of water than to furnish a basis for estimates in this case. As previously stated, the meter rates ordered at this time must be provisional in character. Only the actual experience under a metered system in Beloit can supply figures which will be sufficiently reliable to make an accurate determination of a rate schedule.

The following meter rates are suggested, however, subject to revision by this Commission after a sufficient period has elapsed in order to note their effect on the consumption and revenues in Beloit:

Service charge:

	Per Quarter
1. ⅝ inch meter, one consumer on meter	$1.00
2. ¾ " " " " " "	1.25
3. 1 " " " " " "	1.75
4. 1½ " " " " " "	2.00
5. 2 " " " " " "	3.00
6. 3 " " " " " "	5.00
7. 4 " " " " " "	8.00
8. 6 " " " " " "	15.00

For each additional consumer on the same meter $0.50 per quarter.

Each dwelling, flat, suite, store, tenant, etc., shall be regarded as one consumer in determining the service charge.

Output charge:

10 cts. per M gals. for the first 50 M gals. used per quarter.
6 cts. per M gals. for the next 75 M gals. used per quarter.
2 cts. per M gallons for all over 125 M gals. used per quarter.

Flat rates:

All consumers without sewer or cess pool connection shall pay an annual rate of $5.00, payable in four equal quarterly payments.

The present rates for street sprinkling and for building purposes are not changed at this time.

GAS UTILITY.

When the present management took charge of the gas business in Beloit, the entire manufacturing process was carried on upon the small tract now occupied by the coal gas plant. In one of the rooms of this plant the present water gas set had been installed, but had never been put in operation. The vacant tract north of the station was purchased, it is understood, with the idea of building a new holder upon it. It was pointed out by the manager of the utility in his testimony that the company was confronted with the necessity of extending the plant, and that after discussing the situation with several engineers, it was decided that it would be more economical to move the water gas plant to a new site, which would ultimately be used for the entire manufacturing plant. The same witness stated that while the old site might have been found large enough to accommodate the additional manufacturing capacity required, it would not furnish room for the storage of coke and had insufficient space for the storage of coal. It was also discovered by the present management that the distribution system contained a large amount of small pipe, and that the mains would be inadequate in many places within a few years. For this reason it was decided to install a high pressure system at once. The pumping engines required for the high pressure system increased the total equipment for which space would be required.

The experts for the city suggested an arrangement by which the additional coal gas capacity could have been provided in the new building, as well as the new boilers and pumps. They contended that the holders should have been placed upon the vacant tract purchased for that purpose. They further asserted that the new plant was an unnecessary and extravagant investment; that it is more expensive to operate two plants than one; that since it costs more to manufacture water gas than coal gas, the operating expenses are increased by distributing a mixed gas; and that the additional investment is an unjust burden on the consumers.

It appears certain that the old site would soon have proved inadequate. Some properties in the state are putting out as much gas as respondent on sites no larger than the old site in Beloit. These same plants, however, are known to be now searching for or acquiring new and larger sites or additions to the present tracts. Up to the present time, it is believed, the old site in Beloit would have met all requirements. It is also believed that a good many engineers would have increased the capacity of the old plant and would have obtained the useful wear out of the equipment installed there before building a new plant. This is a matter, however, in regard to which engineers will reasonably differ.

Examination of the construction and equipment account of the company shows that about $184,000 has been expended by the respondent in additions to the gas utility property in improvements and betterments since the consolidation in 1906.

Among the gas plants which have been valued by the engineering staff of the Commission, it is found that the Beloit plant has the largest percentage of total investment in buildings, plant and station. The following table shows the percentage distribution of the total investment:

TABLE XLV.

WISCONSIN GAS PLANTS.

DISTRIBUTION OF INVESTMENT.

	Thous. of total (excl stores).	Percent of Total Investment in												
		Land.	Buildings.	Plant.	Station.	Holder	Mains.	Services.	Meters.	Dist. system.	Office.	Tools.	Miscellaneous.	Stores.
Ripon	32.56	4.75	9.70	11.04	25.49	9.55	43.57	10.50	8.50	62.57	1.24	.76	.39	5.76
Chippewa Falls	45.78	2.31	10.40	20.52	33.23	22.99	29.67	[1]3.46	7.19	40.32	.93	2.21	.32	8.60
Ashland	61.43	3.64	5.40	13.90	22.94	21.14	32.50	9.12	9.78	55.02	.34	.56	....	3.93
Manitowoc	131.53	5.04	5.22	11.47	21.73	9.65	44.94	[1]7.96	13.11	66.41	.96	.96	.29	3.90
Janesville	193.61	3.25	5.11	11.11	19.47	20.48	36.80	10.02	10.62	58.16	.91	.82	.16	3.30
LaCrosse	203.21	5.76	9.04	20.55	35.35	10.62	35.42	[1]5.38	11.24	52.04	.77	1.09	.13	1.06
Kenosha	213.75	1.40	3.41	10.78	15.59	4.45	49.02	14.21	14.33	78.49	.65	.70	.12	4.33
Superior	214.83	1.00	2.31	10.86	14.17	18.51	37.30	10.96	12.36	65.94	.50	.46	.42	3.77
Beloit	246.82	4.15	12.82	23.03	40.00	17.11	25.00	[2]12.66	4.10	41.76	.40	.73	....	....
Appleton	262.18	1.74	7.43	11.47	20.64	6.76	46.47	12.09	12.42	70.98	.31	.88	.43	3.89
Madison	337.32	8.59	5.77	22.57	36.93	10.95	32.23	[1]7.94	9.41	49.58	.69	.80	1.05	....
Racine	780.35	5.41	8.04	18.71	32.16	17.77	26.39	7.45	9.63	[3]48.49	.48	.79	.31	5.21
Average	....	3.92	7.05	15.50	26.48	14.17	36.61	9.31	10.22	57.48	.69	.90	.36	4.38
Minimum	....	1.00	2.31	10.78	14.17	4.45	25.00	3.46	4.10	40.32	.31	.46	.12	1.06
Maximum	....	8.59	12.82	23.03	40.00	22.99	49.02	14.21	14.33	78.49	1.24	2.21	1.05	8.60
Median	....	3.90	6.60	12.69	24.22	14.03	36.11	9.57	10.20	56.59	.67	.80	.32	3.92
Mode	....	....	5.40	11.40	21.00	....	36.40	....	9.60	....	....	.80	.36	3.90

[1] Street portion only.

[2] Includes cost for governors and connections.

[3] Includes Racine-Kenosha high pressure line.

An analysis of the investment in Beloit shows that the total investment per consumer is larger than in any of the other plants listed in the above table. The total investment per mile of main is also larger than all these plants, with the exception of Racine. The total investment per M sales in Beloit is exceeded by three plants and is much nearer the maximum than the average.

These and other studies of the investment in the Beloit plant show that the investment has been brought to a figure considerably in excess of the average of similar plants in the state. It appears that the investment has been very largely for the future. It would seem that when a utility undertakes to build considerably in advance of the needs of the community, the utility can hardly expect a large return upon this investment immediately. On the other hand, if consumers can be induced to pay a profit on this investment, it would appear advantageous for the utility to invest in equipment which will meet demands far into the future. Analysis of the growth of the gas business in Beloit since the consolidation, the present saturation of territory, consumers per mile of main, sales per consumer, etc., indicate that the business has undoubtedly not developed at the rate respondent had anticipated. While the number of consumers per 100 inhabitants is somewhat below the average for the other gas plants in the state, the earnings per consumer are about the maximum of the same plants. At the same time the company cannot be accused of lack of effort to secure new consumers and develop the gas business in Beloit. In the light of these facts, and in the light of the information secured by a careful investigation of the distribution of gas consumers in the city, we are forced to the conclusion, first, that the business is not particularly well developed and the territory well saturated, and second, that this lack of development is in a large measure due to the comparatively high rates in force.

The city contended that great economy could be effected by the substitution of Illinois soft coal for the coke which is now being used as fuel under the benches. The company asserted that no saving in the cost of manufacture could be effected by this substitution. It was pointed out by Mr. A. E. Forestall that, while it is possible to figure out a saving in the cost of the coal as compared with that of coke that would be used, the use of coal involves not only extra labor, but labor of a more skilled kind, since the fires have to be handled with more care with coal than with coke, and, in addition, that the use of soft coal calls for the use of an extra amount of steam under the fires to keep the clinker in condition to be removed. The analysis of coal gas manufacture in the state shows that very little coal is being used under the benches. In a plant the size of respondent's it appears questionable if any great economy would be gained.

In the analysis of the cost of manufacturing by various processes, the city's experts apparently neglected the fact that the cost of maintenance would be increased were all the gas made by the water gas process. Mr. Fowle, in his analysis of 1909 operation, shows the net cost of gas to be 29 cts. in the holder, and quotes Mr. Forstall as stating that it would be 39 cts. Mr. Forstall's figure is higher than the actual value found upon analysis of the accounts of 1909 and 1910, due mainly to the fact that he estimated largely upon the basis of 1908 results, when, as a matter of fact, these costs were somewhat reduced in 1909 and 1910. Some discrepancy was discovered in the company's coke stock account for 1909, and the actual costs show Mr. Fowle's estimate to be somewhat low, but nearer to the real cost than Mr. Forstall's. Mr. Evans claimed that gas could be put into the holder at Beloit for 28.4 cts. per M. In arriving at this figure he used 4 cts. per M as the cost of bench fuel. There does not appear to be a plant in the state that has gone below 6.17 cts. for this item. On the whole, while it is not impossible, perhaps, to manufacture gas in Beloit at the price given by Mr. Evans, it does not seem that this can actually be done in Beloit until the gas sales have materially increased, at least.

The city claimed that if the coal gas plant has been enlarged so that all of the gas made in 1908 could have been coal gas, a great saving in the cost of manufacture would have resulted. The figures that were presented to justify this conclusion were based upon a yield of 5 cubic feet of gas per pound of coal, the production of 1,400 lbs. of coke per ton of coal carbonized, and the use as bench fuel of 450 lbs. of Illinois soft coal, the operating conditions in other respects remaining practically the same as they were during the year 1908. It is possible to obtain a yield as high as 5 cu. ft. in works like that at Beloit, but quite generally that high a yield is seldom obtained in such plants without affecting the quality of gas produced. The yield in Beloit appears to be about the same as the average for similar plants in the state. It also appears that 1,400 lbs. of coke per ton of coal carbonized is somewhat better than is ordinarily obtained. Most plants find that 1,300 lbs. is more nearly correct. The use of coal as bench fuel, as has been pointed out, will hardly result in an economy, for the amount claimed as being all that is necessary seems too small compared to what actual experience tends to show. There are also expenses connected with the use of coal as a bench fuel which would offset, perhaps, the saving in the cost of materials due to its use.

Several tables are shown below which, together with the investigations outlined above, show that the operating costs of respondent's gas utility are not excessive, and show up favorably when compared with that of other utilities manufacturing about the same quantities of gas:

COAL GAS PLANT STATISTICS FOR WISCONSIN.

CLASS A PLANTS.

Summary of Coke Transactions.—Years 1909 and 1910.

	Average.	Minimum.	Maximum.	Median.	Beloit.
Coke sales per M	.2531	.1521	.3473	.2442	.2035 .2548
Coke used per M	.0818	.0094	.1617	.0844	.1168 .1617
Bench fuel:					
Per ton of coal carbonized	404	304	523	399	418 400
Per M made	41.15	29.34	52.32	40.84	42.65 40.82
Cost	.0884	.0617	.1175	.0876	.1175 .1132
Cost of coal	3.93	3.10	4.65	4.05	4.25 4.23
Selling price of coke	5.17	4.25	6.33	5.00	5.62 5.87
Price of coke used by company	4.48	3.10	5.60	4.65	5.60 5.60
Yield of gas per lb. of coal	4.91	4.48	5.44	4.89	4.90 4.90

COST OF COAL GAS PRODUCTION PER M CUBIC FEET MADE IN WISCONSIN.

CLASS A PLANTS.

Years 1909 and 1910.

	Average.	Minimum.	Maximum.	Median.	Beloit 1910.
Superintendence	.0183	.0017	.0419	.0175	.0097
Labor	.0888	.0570	.1148	.0904	.1018
Coal carbonized	.3997	.3245	.4959	.3964	.4172
Bench fuel	.0884	.0617	.1175	.0876	.1132
Enricher	.0022	.0008	.0049	.0015	....
Steam	.0352	.0022	.1155	.0259	.0117
Supplies and expenses	.0186	.0045	.0496	.0171	.0153
Total operating	.6444	.4091	.7912	.6267	.6689
Total maintenance	.0267	.0027	.0478	.0282	.0113
Total production	.6711	.5343	.8237	.6607	.6892
Net earnings from schedules	.3466	.2880	.4313	.3485	.3950
Net cost of production	.3245	.2357	.4503	.3270	.2852

DEPRECIATION.

It is unnecessary at this point to repeat the discussion of the matter of the allowance for depreciation. This question has been dealt with under the discussion of respondent's water utility, and the references there given and the remarks there made apply with equal force to this department of the business.

Computations of the composite life of respondent's gas property have been made, and these together with similar computations previously made and discussed by the Commission throw considerable light on the question of the allowance to be made in this instance. It appears from these investigations that an allowance of approximately 2.2 per cent on the cost new of the depreciable property, or between 1.5 and 1.6 per cent per annum on total property, as computed on the basis of a 2 per cent sinking fund, is ample.

ANALYSIS OF GAS CONSUMPTION.

An analysis of the distribution of gas sales in Beloit has been made which is similar to the analyses described in *State Journal Printing Co. et al. v. Madison Gas and El. Co.* 4 W. R. C. R. 501, 734, and in *City of Racine v. Racine Gas Lt. Co.* 6 W. R. C. R. 228, 316.

Tabulations of the consumer data of the gas consumers in Beloit covering a period of one year were made. These tabulations show the consumption of gas in cubic feet for every gas consumer in Beloit for each and every month during the year when each consumer received service. In the following table this material has been arranged in such form as to show the percentage of the total gas sold during the year in the order of the monthly consumption by thousands of cubic feet. "Where a consumer uses 3,500 cubic feet in a month, it is obvious that 1,000 falls in the first M consumed, 1,000 in the second M and 500 in the fourth M." The above statement illustrates the method by which the following percentages were obtained. It should be emphasized, perhaps, that this table is not based upon average monthly consumption figures, but is compiled from the actual monthly meter readings of each individual consumer. Table XLVI showing the percentage distribution of gas sales follows:

TABLE XLVI.
DISTRIBUTION OF GAS SALES.

	Beloit. Per cent.	Madison. Per cent.	Racine. Per cent.
1st M	37.3	36.88	39.4
2nd M	24.0	23.28	24.6
3rd M	12.3	12.26	11.6
4th M	5.8	6.48	5.4
5th M	3.2	3.76	2.9
6—10 M	6.4	....	5.9
11—15 M	2.8	....	....
16—20 M	1.7	17.34	7.7
21—50 M	3.3	....	....
Over 50 M	3.2	....	2.5
Total	100.0	100.0	100.0

Applying these percentages to the total sales for the years ending June 30, 1909, and June 30, 1910, will give us the total amounts of gas consumed within the limits, or rather in the order described. These figures constitute, then, the foundation for the computations as to the probable revenues under the proposed rates which will be discussed later. It is evident that future revenues calculated on such a basis are based on only one assumption, and that is that the distribution of the sales will vary but little from year to year, which assumption is well founded on the facts as investigation has disclosed them.

Applying the above percentages to the total amount of gas sold by the company during the years ending June 30, 1909, and June 30, 1910, we obtain the following statement of distribution of gas sales:

DISTRIBUTION OF GAS SALES.

	Year Ending	
	June 30, 1909.	June 30, 1910.
1st M	16,440,199 cu. ft.	17,758,717 cu. ft.
2nd M	10,578,144 " "	11,426,520 " "
3rd M	5,421,299 " "	5,856,091 " "
4th M	2,556,385 " "	2,761,409 " "
5th M	1,410,419 " "	1,523,536 " "
6—10 M	2,820,838 " "	3,047,072 " "
11—15 M	1,234,117 " "	1,333,094 " "
16—20 M	749,285 " "	809,379 " "
21—50 M	1,454,495 " "	1,571,146 " "
Over 50 M	1,410.419 " "	1,523,536 " "
Total sales	44,075,600 cu. ft.	47,610,500 cu. ft.

The schedule of gas rates now in force is of a type known as a regressive rate, in that its strict application permits the situation where a consumer using a larger amount of gas than another consumer, may at the same time receive a smaller monthly bill than the latter. This objectionable feature of the schedule has been partly overcome by the respondent, as reference to the statement of monthly bills will demonstrate. It will be noted, for example, that consumers using either 1800, 1900 or 2000 cubic feet of gas per month pay the same total bill for the month's consumption of gas.

It has been demonstrated repeatedly that the total cost of gas service per M cubic feet consumed decreases with increased consumption and it does not appear necessary to repeat the demonstration of this fact herein. Reference is made, however, to the discussion of apportionment of operating expenses and cost curves as presented in *State Journal Printing Co. et al. v. Madison Gas and El. Co.* 4 W. R. C. R. 501, 735—737, and *City of Racine v. Racine Gas Lt. Co.* 6 W. R. C. R. 228, 304—309. Careful investigation of the output costs, as determined for respondent's gas plant, show this cost to be close to 85 cts. per M cu. ft. sold, and 77 cts. per M cu. ft. made.

In the following table XLVII we have computed the probable revenue from the sales of gas for the years ending June 30, 1909, and June 30, 1910, under several schedules:

TABLE XLVII.

PROBABLE REVENUE COMPUTATIONS.

BELOIT GAS UTILITY.

Consumption per month.	Rate per M.	*Year ending June 30, 1909.*		*Year ending June 30, 1910.*	
		M cu. ft. sold.	Revenues.	M cu. ft. sold.	Revenues.
1st 2 M	$1 50	27,018.3	$40,527 51	29,185.2	$43,777 86
Next 8 M	1 25	12.208.9	14,261 17	13,188.3	16,485 14
Over 10 M	1 00	4,848.3	4,848 32	5.237.1	5,237 15
Total		44,075.5	$59,637 00	47,610.6	$65,500 15
1st 2 M	$1 40	27,018.3	$37,825 62	29,185.2	$40,859 28
Next 8 M	1 25	12,208.9	15,261 12	13,188 3	16,485 13
Over 10 M	1 00	4,848.3	4,848 31	5,237.1	5,237 15
Total		44,075.5	$57,935 05	47,610.6	$62.581 56
1st 5 M	$1 25	36,406.4	$45,508 03	39.326.3	$49,157 84
Next 10 M	1 15	4 054.9	4,663 20	4.480.2	5,152 19
Over 15 M	90	3.614.2	3,252 78	3,904.1	3,513 65
Total		44,075.5	$53.424 01	47,610.6	$57,823 68
1st 5 M	$1 25	36,406.4	$45,508 03	39.326 3	$49.157 84
Next 5 M	1 10	2.820.8	3,102 92	3,047.1	3.351 78
Over 10 M	90	4,848.3	4,363 47	5,237.1	4,713 44
Total		44,075.5	$52,974 42	47.610.6	$57.223 06
1st 2 M	$1 25	27,018.3	$33,772 87	29,185.2	$36,481 50
Next 8 M	1 10	12,208.9	13.429 83	13,188.3	14,506 91
Over 10 M	90	4,848.3	4,363 47	5,237.1	4,713 44
Total		44,075.5	$51.566 17	47,610.6	$55,701 85
Present earnings			$59,618 66		$64,264 74

It will be noted that in the probable revenues computed in the foregoing table no allowance or addition has been made to cover the revenue from minimum bills and forfeited discounts. Also no account has been taken of the receipts from the maintenance of apparatus, piping and connections, etc. In fact, the latter work appears to have been done at a loss during the past few years.

As regards the so-called "consumer" expenses, which are dependent upon and vary with the number of consumers or meters, the following table is presented showing the total cost of certain items in this list:

Item.	Year ending June 30,	
	1909	1910
Labor removing and resetting meters	$432.91	$225.91
Customers' premises expenses	344.92	339.13
Meter and fitting dept. supplies and expenses	....	75.11
Maintenance of services	119.45	133.98
Maintenance of meters	678.49	731.84
Collection expenses	552.45	802.66
Total	$2,128.22	$2,308.63

Dividing the above totals by the number of meters in use each year, we obtain a total cost per meter per year of about $1.29 for the year ending June 30, 1909, and a cost of about $1.28 for the year ending June 30, 1910. These costs will be about $0.108 and $0.107 per month per meter, respectively. The fixed charges per meter will be practically the same as shown in the computations presented in the decision of the Commission in *City of Racine v. Racine Gas Lt. Co.* 6 W. R. C. R. 228, 310—313.

From the facts therein presented, combined with the consumer costs as computed above, we find that the total cost per meter per month in Beloit ranges from about 17.5 cts. for three light meters up to about 70 cts. for 100 light meters.

In considering the investment, operating expenses and other factors entering into the determination of the facts as related to the gas department of the respondent utility, the South Beloit property has been considered a part of the property as a whole, and while all the earnings, expenses and investment in that company have been included, no special treatment of the particular property has been given, as no facts have been revealed which justify in our mind a separate and distinct treatment of that property as distinguished from the property of the respondent.

As regards the situation in respect to respondent's gas service, and this applies with equal force to the other departments, the following statement of the Commission is directly in point in this case:

> "The original cost of a plant is also an element that should be taken into consideration in determining its value for rate-making purposes. In fact, this cost is often one of the most important factors that enter into such determinations. In this case, however, we have not been able to obtain what we could

regard as entirely reliable data as to this cost. During its existence the plant has changed ownership. A considerable proportion of it was constructed by other than the present owners. The earlier records were, therefore, not available. It is, of course, a fact that the plant is carried at a certain cost on the books of its present owner. The cost there given, however, does not seem to meet the situation. For, like most cost figures of the kind, it appears to include items that could hardly be regarded as relevant in these proceedings. Owing to the fact, however, that in computing the cost of reproduction of the plant as given herein the figures used as the cost of labor and material were the average prices for a series of years rather than the prices which prevailed at the time the appraisal was made, it is not unlikely that the original cost of the plant is quite closely represented by the above cost of reproduction new. At any rate, we have frequently found that, in cases where full data as to the original cost of plants were available and where the cost of reproduction had been compiled on the same bases as those used in this case, the original cost and the cost of reproduction new were not far apart." *City of Racine v. Racine Gas Lt. Co.* 6 W. R. C. R. 228, 285—286.

The cost of reproduction new of the property, as of date June 30, 1910, after making the additions to the tentative valuation of Jan. 1909, for the extensions and additions to property made during that period and after deducting paving not actually paid for by the company, has been found to be about $321,380, and the existing value about $300,609.

For the purposes of the calculations made in this decision, the valuation of the gas department of the respondent utility has been taken as the average of value for the years considered rather than the value at the end of the year, the figure for the end of the year ending June 30, 1910, being taken as about $310,000.

From the facts revealed in the testimony and by subsequent investigations, we believe we are justified in finding that the situation is such in regard to the total investment in the physical property of the gas department, in the development of the business of the plant, and in the possible future development and saturation of territory, that it is far from clear whether it is equitable to the consumers of the service and for the best interests of the plant as well as its customers, to fix rates for the gas service in Beloit which will bring a return for interest and profit on the cost of reproduction as high as may ordinarily be considered reasonably adequate in plants of this size. We do not feel justified, on the other hand, in using a valuation lower, or in fixing rates lower, than those figures which are used in this instance, but it is believed that the reduction given in this case will have a material effect on the future growth of the business and hasten the time when further reductions may be made possible.

The following schedule of gas rates is believed to be fair and reasonable:

$1.25 net or $1.35 gross per M cubic feet for the first 5 M cubic feet used during any one month through any one meter.

$1.15 net or $1.25 gross per M cubic feet for the next 10 M cubic feet used during the same month through the same meter.

$0.90 net or $1.00 gross per M cubic feet for all gas in excess of 15 M cubic feet used during the same month and passing through the same meter.

The minimum bill shall be graduated according to the size of meter and shall be as follows:

Size of meter	Amount to be charged each month	Size of meter	Amount to be charged each month
3-light	.25	60-light	1.00
5- "	.25	80- "	1.50
10- "	.35	100- "	2.00
20- "	.40	150- "	3.00
30- "	.50	200- "	4.00
45- "	.60		

The effect of the proposed rates upon the monthly bills of the consumers is shown in the following table XLVIII:

TABLE XLVIII.

COMPARISON OF PRESENT AND PROPOSED RATES.

Gas consumed per month, cubic feet.	Monthly bill as charged by company.	Monthly bill according to present rate schedule.	Monthly bill under proposed rates.
1,000	$ 1.60	$ 1.60	$ 1.25
1,500	2.35	2.35	1.88
1,800	2.70	2.80	2.25
1,900	2.70	2.95	2.38
2,000	2.70	2.70	2.50
2,500	3.35	3.35	3.13
3,000	4.00	4.00	3.75
4,000	5.30	5.30	5.00
5,000	6.60	6.60	6.25
6,000	7.90	7.90	7.40
7,000	9.20	9.20	8.55
8,000	10.50	10.50	9.70
9,000	11.80	11.80	10.85
9,700	12.10	12.71	11.56
9,800	12.10	12.84	11.77
9,900	12.10	13.97	11.89
10,000	12.10	12.10	12.00
15,000	18.10	18.10	17.75
19,800	22.10	23.86	22.07
19,900	22.10	23.98	22.16
20,000	22.10	22.10	22.25
30,000	33.10	33.10	31.25
50,000	50.10	50.10	49.25
100,000	100.10	100.10	94.25

ELECTRIC UTILITY.

ANALYSIS OF ELECTRIC CONSUMER DATA.

Considerable detailed information and statistics have been submitted by both the city and company from which data the analysis of local conditions has been made. Among other things. there have been prepared from the consumer ledger of the company statements showing the sales to each and every consumer for the period of a year. This information covers the monthly sales to and revenue from each consumer during the year, and also shows the total connected load of each consumer, together with the classification of the user as residence, store, office, saloon, hotel, etc.

With this and other information at hand, a number of studies of the situation in Beloit have been made, and comparisons made with other cities where such comparisons will assist in appreciating the influence of the several factors entering into the problem before us in this case.

Taking up first the commercial lighting consumers, the following table shows the total number of consumers in the various classes and other facts concerning these classes, for the years covered by the annual reports to the Commission:

TABLE XLIX.

BELOIT COMMERCIAL LIGHTING CONSUMERS.

Class.	*Year ending June 30, 1909.*			*Year ending June 30, 1910.*		
	No. of consumers.		Per cent on meter basis.	No. of consumers.		Per cent on meter basis.
	Full 12 months.	Less than 12 months.		Full 12 months.	Less than 12 months.	
Residences	307	81	100	333	116	100
Saloons	17	7	91	18	12	100
Offices	61	12	100	55	14	100
Stores	98	30	96	84	41	100
Laundries	2	....	100	3	1	100
Livery stables	5	....	100	5	1	100
Industrial estab	6	2	100	10	4	100
Hotels	8	....	100	6	....	100
Restaurants	2	2	100	1	9	100
Theaters	3	2	100	3	6	100
Churches	10	2	100	9	4	100
Lodge halls and club rooms	10	2	99	14	6	100
Bowling alleys	1	....	100	1	....	100
Schools	6	4	100	9	....	100
Depots	5	....	100	2	....	100
Miscellaneous	10	12	90	26	23	100
Signs and outlines	25	11	....	28	30	....
Total	576	167	93	607	267	93

The company furnished service to 743 consumers during the year ending June 30, 1909, of which number 167, or 22.5 per cent, received service less than the full year. For the year ending June 30, 1910, the company supplied a total of 874 consumers, 267, or 30.5 per cent, being less than 12 month users.

Tables L and LI, shown on pages 359 and 360, bring out the more salient points in regard to the consumption of electricity by the various classes. These tables cover the data for the calendar year 1909.

Residences.

Company's residence class consists of dwellings, apartment houses and flats, private and student rooming houses, and fraternities.

1. For the year 1909 company reports 444 residence consumers, 274 were full 12 month consumers, or 61.7 per cent of the total. Comparing these figures with other cities, we find Madison with 76.1 per cent, Manitowoc 74 per cent, Marinette 57 per cent, Ripon 70 per cent.

2. The company furnished service to a total of 510 commercial lighting consumers for the full 12 months of the year. Of this total 274, or 54 per cent, were residence consumers. The same ratio for other cities is 73 per cent for Madison, 58 per cent for Marinette, 64 per cent for Manitowoc, and 71.5 per cent for La Crosse.

3. The average installation for the twelve month users, expressed in 16 c. p. lamps is as follows: Beloit 20.4 16 c. p. lamps per residence consumer, Madison 16.8, Marinette 19.6, Manitowoc 17.3, and La Crosse 18.

The residence installation in Beloit varies from 1 to 179 lamps of 50 watt equivalent, the prevailing installation being 9 lamps. In Madison the installation varies from 1 to 144 lamps, 10 being the prevailing number. Marinette shows a variation of from 3 to 126 lamps, with 12 the most prevalent. Manitowoc installations vary from 2 to 102, most prevalent 11.

TABLE L.

BELOIT ELECTRIC CONSUMER DATA.

METERED COMMERCIAL LIGHTING CONSUMERS.

Calendar Year 1909.

CLASS.	NO. OF CONSUMERS.			Kw. installed for 12 mo. consumers.	Kw. installed for less than 12 mo. consumers.	Kw. hrs. consumed by 12 mo. consumers.	Kw. hrs. consumed by less than 12 mo. consumers.	Receipts from full 12 mo. consumers.	Receipts from less than 12 mo. consumers.
	Using 12 mo.	Less than 12 mo.	Total.						
Residences	274	170	444	279.034	152.016	68,048	19,984	$9,247 30	$2,931 02
Saloons	17	5	22	18.925	5.852	24,850	2,796	1,481 93	173 22
Offices	48	12	60	32.455	7.089	25,738	1,004	2,035 78	151 37
Stores	76	28	104	119.678	19.713	99,911	6,197	6,697 65	527 72
Laundries	2	1	3	2.730	.168	953	47	103 21	7 08
Livery stables	6	1	7	3.587	.616	4,438	169	284 27	13 55
Industrial establishments	25	11	36	60.731	7.741	25,651	458	2,121 35	72 96
Hotels	5	....	5	24.145	....	17,643	....	1,140 11	....
Restaurants	3	8	11	2.545	3.610	4,214	2,397	279 85	146 47
Theaters	5	....	5	29.486	....	24,612	....	1,460 43	....
Churches	9	3	12	46.307	10.745	4,013	770	473 44	109 79
Lodge halls and club rooms	9	9	18	15.060	7.776	8,014	6,197	636 49	527 72
Schools	....	5	5	....	37.975	....	2,648	....	274 05
Municipal buildings	7	....	7	13.885	....	5,629	....	420 14	....
Barber shops	6	6	12	2.869	2.616	2,120	478	203 13	65 23
Shine parlors	3	1	4	.759	.158	433	60	62 04	11 72
Hall lights	3	....	3	1.120	....	749	....	64 65	....
Hospitals	2	....	2	1.741	....	4,935	....	286 93	....
College buildings	2	....	2	50.712	....	25,191	....	1,514 86	....
Miscellaneous	8	8	16	9.019	7.666	6,175	2,245	463 89	217 56
Total	510	268	778	715.088	273.741	353,317	45,450	$28,977 45	$5,229 46

TABLE LI.

BELOIT ELECTRIC LIGHT CONSUMER DATA.

FOR FULL 12 MONTH CONSUMERS.
Year 1909.

Class.	Average kw. hrs. consumed by each consumer.	Average receipts from each consumer.	Average No. 16 c. p. lamps installed	Average hrs. use of full connected load.	Kw. hrs. per 16 c. p. lamp.	Average yearly revenue per lamp.	Average yearly revenue per kw. hr.
Residences.........	248	$33 75	20.4	.665	12.16	$1 65	$0.136
Saloons	1,462	87 18	22.3	3.562	65.56	3 91	.059
Offices..............	536	42 41	13.5	2.175	39.70	3 14	.079
Stores..............	1,315	88 13	31.5	2.285	41.75	2 80	.067
Laundries..	477	51 60	27.3	.955	17.47	1 89	.106
Livery stables.....	739	47 33	12.0	3.374	61.58	3 94	.064
Industrial est......	1,026	84 87	48.6	1.155	21.11	1 75	.082
Hotels..............	3,529	228 02	96.6	2.000	36 54	2 35	.064
Restaurants........	1.405	93 28	17.0	4.810	82.65	5 49	.066
Theaters...........	4,922	292 09	117.9	2.285	41.74	2 48	.059
Churches...........	446	52 60	103.6	.235	4.30	.51	.118
Halls. lodges.clubs	890	70 72	33.5	1.455	26.56	2 11	.079
Municipal bldgs .	804	60 02	39.7	1.110	20.25	1 51	.074
Barber shops	353	33 85	9.5	2.035	37.16	3 56	.095
Shoe shine parlors	144	20 68	5.0	1.289	28.80	4 13	.143
Hall lights.........	249	21 55	7.5	1.817	33.20	2 87	.086
Hospital............	2,467	143 47	17.4	7.690	141.80	8 25	.058
College bldgs......	12,595	757 43	507.1	1.361	24.82	1 49	.061
Miscellaneous......	772	57 99	22.5	1.885	34.31	2 58	.075

Beloit, then, appears to have a comparatively high average installation per residence consumer, a low prevalent installation, and a variation between wide limits. The distribution of consumers and connected load for residences is given in percentages of the total for groups of five lamps in table LII, which follows:

TABLE LII.

DISTRIBUTION OF CONSUMERS AND CONNECTED LOAD RESIDENCE LIGHTING.

12 MONTH USERS.

No. Lamps	Percent of number of consumers					Percent of number of lamps				
	Beloit	Madison	Marinette	Manitowoc	Ripon	Beloit	Madison	Marinette	Manitowoc	Ripon
0-5....	4.7	3.36	.86	3.32	4.2	.7	.86	.18	.67	1.1
6-10...	17.2	24.10	9.48	19.10	18.0	7.5	12.41	4.33	9.38	7.9
11-15...	16.7	32.86	33.60	29.37	20.0	10.7	25.26	22.40	21.80	13.8
16-20...	23.7	17.77	24.12	23.27	22.3	20.8	18.85	21.72	24.20	22.3
21-25...	15.0	9.50	14.64	13.08	14.3	16.7	12.84	16.99	17.22	17.9
26-30...	8.8	4.88	6.03	4.73	10.5	11.9	8.19	8.32	7.57	15.8
31-35...	3.3	2.37	4.73	2.16	3.3	5.2	4.82	7.87	4.01	5.7
36-40...	4.0	1.52	2.15	1.51	5.4	7.3	3.46	4.31	2.35	10.3
41-45...	2.6	.89	1.72	.65	2.0	5.4	2.26	3.65	1.62	5.2
46-50...	1.1	.70	.43	.87		2.6	2.02	1.03	2.45	
Over 50	2.9	2.05	2.24	1.94		11.2	9.03	9.20	7.73	
	100.0	100.00	100.00	100.00	100.0	100.0	100.00	100.00	100.00	100.0

The foregoing tabulation shows that in Beloit the greatest percentage of total consumers, or 23.7 per cent, have installations falling in the group of 16–20 lamps (16 c. p. equivalent), while in Madison, Marinette and Manitowoc the greatest percentage occurs in the 11–15 lamp group. The same difference is apparent when the number of lamps rather than the number of consumers is considered. Expressed in another form, it appears that in Beloit 38.6 per cent of consumers have installations of less than 15 lamps, while in Madison, Marinette and Manitowoc the percentages are 60.32, 43.94 and 51.79, respectively. Again, it is evident that the percentage of total consumers and lamps falling in the groups of 30 lamps and over is larger in Beloit than in the other cities included in the table.

It would appear from these figures and comparisons that the small consumer field in Beloit is comparatively poorly developed.

In making a study of the unit sales in Beloit "per lamp per year" and "per consumer per year," we find these very well developed. For Beloit the average sales "per lamp per year" is 12.12 kw. hrs., while for Madison it is 14.12. Madison appears better developed in this respect than the other two cities, but this same may be said of Beloit when a camparison is made with Marinette and Manitowoc, where the average sales are 9.33 and 7.64 kw. hrs., respectively.

For Beloit the average sales "per consumer per year" is 247.7 kw. hrs., and this is even larger than Madison, which is 237. The Marinette average is 182 and Manitowoc 131.

TABLE LIII.

ANALYSIS OF CURRENT SOLD.—RESIDENCE LIGHTING.

12 MONTHS USERS.

No. lamps	Kw. hrs. per lamp per yr.				Kw. hrs. per consumer per yr.				Per cent. of total current sold.			
	Beloit.	Madison.	Marinette.	Manitowoc.	Beloit.	Madison.	Marinette.	Manitowoc.	Beloit.	Madison.	Marinette.	Manitowoc.
1—5.........	51.24	41.20	24.40	23.60	153.7	163	98	85	2.94	2.33	.43	2.80
6—10.........	15.91	17.20	15.90	9.86	141.8	149	143	84	9.82	15.18	6.94	12.10
11—15.........	15.23	13.90	9.90	7.95	201.0	180	129	102	13.63	25.02	22.28	22.60
16—20.........	9.66	14.20	7.60	7.26	172.2	252	136	130	16.48	18.94	23.34	23.05
21—25.........	10.93	13.40	9.70	6.41	250.5	306	220	145	15.13	12.10	16 54	14.45
26—30.........	8.97	12.50	8.90	6.16	248.6	354	232	170	8.79	7.29	7.15	6.11
31—35.........	9.22	10.02	9.60	7.03	299.1	330	313	226	3.96	3.36	7.61	3.69
36—40.........	8.15	11.40	6.40	6.18	305.3	431	251	238	4.95	2.79	2.78	2.70
41—45.........	18.98	14.35	10.70	3.25	816.1	613	443	141	8.42	2.30	3.92	.69
46—50.........	12.06	12.33	11.70	5.94	574.7	597	551	293	2.54	1.76	1.21	1.91
Over 50......	14.41	13.98	8.40	8.88	1132.6	1010	708	614	13.34	8 93	7.80	10.62
Average	12.12	14.12	9.33	7.64	247.7	237	182	131	100.00	100.00	100.00	100.00

In studying and comparing the groups in which the greatest percentage of the total current sold falls, Beloit shows nearly the same amount for the groups 11 to 15 lamps, which is 13.63 per cent; 16 to 20 lamps, which is 16.48 per cent; and 21 to 25 lamps, which is 15.13 per cent. Madison is decidedly prominent in the group 11 to 15 lamps, which shows 25.02 per cent. This cannot be said of Marinette and Manitowoc, which have a distribution in this regard similar to Beloit, though far more pronounced in the three groups. The percentages for Beloit show a more gradual rise and fall from the group 16 to 20 lamps.

TABLE LIV.

BELOIT ELECTRIC RESIDENCE CONSUMER DATA.

SHOWING AVERAGE DAILY USE OF FULL CONNECTED LOAD.

12 Mo. Users.

Hours daily use.	Consumer.		16 c. p. lamps.		Kw. hrs. used.		Total receipts.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
0 to ¼..........	21	7.66	722	12.89	7,569	11.12	$763 05	8.25
¼-½..........	101	36.86	2,343	41.82	15,892	23.35	2,556 77	27.65
½-¾..........	66	24.09	1,329	23.72	14,522	21.34	2,205 53	23.85
¾-1..........	35	12.77	513	9.16	7,977	11.72	1,221 88	13.22
1-1½..........	32	11.68	459	8.19	9,934	14.61	1,336 13	14.77
1½-2..........	4	1.46	37	.66	1,082	1.59	162 61	1.76
2-3..........	8	2.93	155	2.77	6,546	9.62	538 90	5.83
3-4..........	1	.36	4	.07	232	.34	35 67	.38
Over 4..........	6	2.19	40	.72	4,294	6.31	396 76	4.29
Total......	274	100.00	5,602	100.00	68,048	100.00	$9,247 30	100.00

This table shows what proportion of the total number of twelve months residence consumers, lamps, kilowatt hours used, and total revenue is included under the various divisions or groups arranged and classified according to the hours' daily use of the full connected load.

Attention is directed to the very large percentage of the consumers who use their connected load for less than ¾ hours per day. This includes 68.61 per cent of the total number of consumers. This same thing is true for the number of 16 c. p. lamps, which shows 78.43 per cent for ¾ hours and less. In the matter of receipts and kilowatt hours used, this is not so marked, the percentage for kilowatt hours used being 55.81 of the total, and for receipts 59.75.

TABLE LV.

RELATION BETWEEN RESIDENCE REVENUE AND HOURS OF DAILY USE OF CONNECTED LOAD.

12 Month Consumers.

No. hours daily use.	Ripon.	Manitowoc.	Marinette.	Madison.	Beloit.
0-¼	45	27	14	6	8
¼-½	37	42	43	26	28
½-¾	13	17	16	21	24
¾-1	5	7	14	14	13
1-1½	....	6	11	15	15
1½-2	....	....	1	7.5	2
2-3	....	1	1	6.5	6
3-4	....	....	....	2	....
Over 4	....	....	....	2	4
Total	100	100	100	100.0	100

Next to Madison, in the five cities for which we have figures, Beloit shows a larger percentage of the total revenue gained from using the connected load from one hour a day and over than any of the other three. Beloit's greatest percentage of the total, like all the others but Ripon, is between ¼ and ½ hour a day.

TABLE LVI.

RELATION BETWEEN NUMBER OF CONSUMERS AND HOURS OF DAILY USE.

12 Months.

Hours daily use.	Ripon.	Manitowoc.	Marinette.	Madison.	Beloit.
0-¼	60	40	21	13	8
¼-½	26	43	52	35	37
½-¾	10	9	12	20	24
¾-1	4	21	7	12	13
1-1½	....	3	6	11	12
1½-2	....	....	1	4	1
2-3	....	1	1	3	3
3-4	....	....	....	1	....
Over 4	....	....	....	1	2
Total	100	100	100	100	100

The greatest percentage of the total number of consumers in Beloit comes within the group ¼ to ½ hour's daily use. This is true of the others with the exception of Ripon, which falls in the first group. The distribution in the case of Beloit over the groups ½ to ¾, ¾ to 1, shows that Beloit consumers are users of the entire *connected* load for longer periods during the day than the others.

TABLE LVII.

RELATION BETWEEN CURRENT USED AND HOURS OF DAILY USE.

12 MONTH CONSUMERS.

Residences.

Hours daily use.	Ripon.	Manitowoc.	Marinette.	Madison.	Beloit.
0-¼	45	25	13	4	11
¼-½	38	42	39	21	23
½-¾	13	19	21	22	21
¾-1	4	7	14	15	12
1-1½		6	10	16	15
1½-2		1	2	9	2
2-3			1	7	10
3-4				3	
Over 4				3	6
Total	100	100	100	100	100

This table and the table following bring out relations which are similar in many respects to those described in the preceding analysis regarding the hours daily use of connected load, etc.:

TABLE LVIII.

RELATION BETWEEN CONNECTED LOAD AND HOURS DAILY USE.

12 MONTH CONSUMERS.

Residences.

Hours daily use.	Ripon.	Manitowoc.	Marinette.	Madison.	Beloit.
0—¼	65	50	28	23	13
¼—½	27	35	49	30	42
½—¾	6	9	10	19	24
¾—1	2	4	7	11	9
1—1½		1	5	10	8
1½—2		1	1	4	1
2—3				2	2
3—4					
Over 4				1	1
Total	100	100	100	100	100

The present saturation of territory or development of electric business in Beloit may be compared with other class A plants in the state, and this comparison, together with the detailed analysis above given, throws considerable light on the situation in Beloit. Table LIX, which follows, gives a comparative statement of the situation in Wisconsin cities. The cities included in the list range in population from 5,036 to 30,417, Beloit being near the average for the cities included in the statement.

TABLE LIX.

ELECTRIC CONSUMER DATE.

From 1910 Reports to Commission.

City.	Population 1910.	Number of lighting consumers	Per cent using 12 mos.	Residence consumers	Per cent using 12 mos.	Number of power consumers	Per cent using 12 mos.	Light consumers per 100 population.	Res. consumers per 100 population.	Power consumers per 100 population.	Total consumers per 100 population.	Commercial lighting earnings.	Commercial power earnings.	Average receipts per lighting consumer.	Average receipts per power consumer.
Menomonie.....	5,036	338	75	181	73	14	78	6.7	3.6	.28	6.98	$10,370 42	$1,455 10	$30 68	$108 90
Oconto..........	5,629	551	83	179	78	14	65	9.8	3.2	.25	10.05	12,317 27	3,158 65	22 35	24 49
Portage.........	5,440	405	89	259	88	19	63	7.5	4.8	.35	7.85	11,282 65	3,769 45	27 85	198 38
Rhinelander ...	5,637	468	82	297	80	39	72	8.4	5.3	.69	9.09	15,061 41	716 80	32 18	18 38
Beaver Dam....	6,758	488	94	309	89	18	45	7.2	4.6	.27	7.47	17,124 56	1,724 91	35 09	94 95
Antigo..........	7,196	805	88	528	....	28	100	11.2	8.1	.39	11.59	21,728 98	1,560 41	26 94	55 72
Grand Rapids..	6,521	673	....	578	84	17	....	10.4	8.1	.26	10.66	19,442 37	1,111 02	28 89	65 36
Waukesha......	8,740	287	78	112	13	24	100	3.3	1.3	.27	3.57	11,563 14	2,543 26	40 29	105 95
Merrill..........	8,689	539	94	265	....	41	82	6.2	3.1	.47	6.67	15,921 41	3,726 03	29 54	90 88
Manitowoc......	13,027	1,355	79	947	75	32	78	10.4	7.3	.25	10.65	31,383 93	1,197 99	23 16	37 44
Janesville	13,894	1,136	....	658	....	115	....	8.2	4.8	.83	9.08	42,364 18	17,419 85	37 29	151 48
Marinette,......	14,610	988	69	644	66	53	56	6.7	4.4	.36	7.06	26,820 47	6,280 66	27 15	118 53
Beloit...........	15,125	874	69	388	79	41	54	5.8	2.6	.27	6.07	38,439 98	13,755 36	43 98	335 50
Wausau.........	16,560	1,218	....	834	....	68	....	7.3	5.0	.41	7.71	34,232 61	26,577 36	28 10	39 09
Appleton........	16,773	1,596	77	904	74	201	69	9.5	5.4	1.20	10.70	56,021 20	22,656 08	35 10	112 70
Eau Claire......	18,310	832	74	397	80	72	83	4.6	2.2	.39	4.99	34,893 30	25,147 40	41 94	349 30
Kenosha........	21,371	1,036	....	....	....	78	....	4.8	....	.36	5.16	35,347 09	12,705 44	34 12	162 85
Green Bay......	25,236	1,184	69	707	71	101	66	4.7	2.8	.40	5.10	48,679 41	6,641 70	41 12	65 76
Madison........	25,531	3.462	68	2,543	67	192	78	13.6	9.9	.75	14.35	163,637 13	28,495 91	47 27	148 42
Sheboygan......	26,398	1,432	83	....	....	123	63	5.4	....	.46	5.86	57,727 57	17,037 99	40 32	138 53
La Crosse........	30,417	3,528	....	1,779	....	269	....	11.6	5 8	.88	12.48	106,450 83	59,781 53	30 18	222 26
Maximum	30,417	3,528	94	2,543	....	269	100	13.6	9.9	1.20	14.35	163,637 13	59,781 53	47 27	349 30
Minimum.....	5,036	287	68	112	....	14	45	3.3	1.3	.25	3.57	10,370 42	716 80	22 35	18 38
Average.,......	14,090	1,104	79	625	....	74	72	7.6	4.8	.46	8.43	....	....	33 50	125 70

The foregoing tabulation shows that while the average number of commercial lighting consumers per 100 population is 7.8, with a maximum of 13.6 and a median of 7.3, the same figure for Beloit is 5.8. Of the commercial lighting consumers, residences constitute the greatest proportion. Beloit residence consumers per 100 population number 2.6, while the average for all the plants is 4.8, with a maximum of 9.9 and a median of 4.8. Total consumers number 6.07 per 100 population in Beloit, as against an average of 8.43, a maximum of 14.35 and a median of 7.7 for all the plants.

While the development is thus shown to be comparatively poor in Beloit, the earnings per lighting consumer, on the other hand, are very near the maximum, being exceeded by only one plant in the list in this respect. The present consumers of electricity in Beloit have been checked off in the latest city directory and have also been located on a map of the city. The result of this study, together with the facts brought out in the detailed and comparative analyses of the electric consumer data, as already discussed and described, point to the conclusion that the territory is far from being well saturated and the electric business fully developed. This appears to be particularly true as regards the residence consumers, especially the class known as "small consumers." In fact, the present policy, as evidenced by the rates of the company, appears to be one of discouraging this class of business.

It will be noted in this connection that the present rates of the company are so constructed as to force the great majority of residence consumers to pay for their entire consumption on the primary rate of 15 cts. net per kilowatt-hour. An optional rate is offered to consumers in the down town district, which permits these customers to take advantage of a service charge rate with a comparatively low rate per kilowatt hour consumed.

The nature of the electric utility business and its relation to the scale of charges has been discussed very fully by this Commission in many previous decisions and no repetition of these matters will be attempted herein. The following citations, it is believed, will suffice to indicate the fundamental principles and to call attention to the decisions where a more extended discussion may be found:

"Rate schedules, which are based exclusively on other considerations than the cost of the service to the plant, are not only likely to be inequitable as between the different classes of consumers, but they are also apt to retard the proper development of the business of the plant. That this is the case, can readily be shown. For instance, we may assume a case where the consumers for some reason may desire to use the current a greater number of hours per day than they have been using it in the past. This would increase the output of the plant without at the same time increasing the maximum demand upon it. An increase of this character would not require any increase in the capacity of the plant and would therefore not affect the fixed expenses. *In re Menominee & Marinette Lt. and Tr. Co.* 3 W. R. C. R. 778, 827.

And again it has been noted that

"Since increasing plant operation through daily long-hour consumption reduces the fixed expense per unit, it becomes apparent how important it is for both the management and subscribers that the plant become loaded with such business as will bring about a reduction in the unit cost, and that the rate schedule be so framed as to recognize the cost of service." *City of Ripon v. Ripon Lt. & Water Co.* 5 W. R. C. R. 1, 34.

"Unless under conditions of this character prices change with changes in the cost, some among the consumers are likely to have to contribute more than their share of the income of the plant. Unless in such cases prices are adjusted to the cost, it also becomes very difficult, if not impossible, to extend the use of the current. Since, as shown, the cost per unit gradually grows less as the use of current is increased, any failure to develop the business of the plant to the fullest extent possible is almost certain to result both in lower profits to the plant and in higher rates to the consumers." *In re Menominee and Marinette Lt. & Tr. Co.* 3 W. R. C. R. 778, 828.

The above facts in regard to the electric utility business are applicable in this case and bring out the important fundamental principles that rates must, to a large extent, be founded on costs, that these costs are of two kinds, fixed and variable, that the rates for different classes of service or of consumers should recognize the cost of the service to these classes, that increasing production brings decreasing unit costs, and that lowest unit costs can only be secured through the best possible development of the business and through the best possible adjustment of the rates to meet the expenses and character of service demanded by the several classes of consumers.

Apportionment of Expenses.

This brings us to the determination of the character of the service rendered to the several classes of consumers in Beloit and the pro-rating of the total costs between these classes.

The electric utility in Beloit furnishes service to several classes of service, namely, commercial lighting, municipal contract lighting, and commercial power, some of the latter service being supplied to the respondent's water utility.

> "The importance of a correct separation of the demand and output expenses is chiefly found in the fact that, in computing the costs per unit for rate-making purposes, that part of the expenses which depends upon the demand should be distributed over the demand or on the active load, while that part of the expenses which depends on the output should be distributed over the sales. In other words, from a theoretical point of view each consumer should contribute to the demand charges in proportion to his demand on the plant, and he should also share in the output expenses in proportion to the amount of current he uses. The two items together should make up the total amount he is charged for the services he receives. In actual practice, however, competitive and other conditions are frequently encountered under which rates so computed may require many modifications, if certain classes of customers are desired by the plants." *State Journal Printing Co. et al. v. Madison Gas and El. Co.* 4 W. R. C. R. 501, 663.

The methods used in apportioning the expenses of electric utilities have been shown in detail and discussed very fully in a number of proceedings before this Commission. Careful separation of the total expenses between the output and the capacity or demand costs have been made in this case and local conditions have been given full consideration in the apportionments made. The results of these computations and analyses would appear to indicate quite closely that the total costs, including taxes, depreciation, and interest and profit on investment will be divided about 55 per cent output and 45 per cent capacity. The hydraulic generation has its influence in reducing the percentage of output expenses below what this percentage would be were the current generated entirely by steam power.

The respondent reports a total connected load on June 30, 1910, of about 1,662 kws. Assuming that 50 per cent of this load is active, and dividing the total capacity expense by this active load, we obtain a capacity cost of about $32.60 per year per kilowatt of active load. This amount divided by 365 reduces the capacity cost to about 8.94 cts. per day. The total output cost divided by the total current output for the same year gives a cost of about 1.7 cts. per kw. hr. generated. From these approximate figures as a basis, we can compute roughly the cost of operation of the plant for various hours daily use and demonstrate the fact that increasing consumption brings decreasing unit costs.

Hours daily operation.	Capacity cost.	Output cost.	Total cost.
½	17.88	1.7	19.58
1	8.94	1.7	10.64
2	4.47	1.7	6.17
3	2.76	1.7	4.46
5	1.79	1.7	3.49
10	.89	1.7	2.59
20	.45	1.7	2.15

"The above figures show clearly how rapidly the cost of electric service decreases with the increasing use of current per day. They also show the fallacy of a schedule of uniform rates which takes no recognition of such declining costs. Since increasing plant operation through daily long-hour consumption reduces the fixed expense per unit, it becomes apparent how important it is for both the management and subscribers that a plant become loaded with such business as will bring about a reduction in the unit cost, and that the rate schedule be so framed as to recognize the cost of service. It is not always practicable and sometimes it is impossible to adhere closely to the table of costs, but the analysis shows facts and forces which must be observed in the construction of the rate schedule."—*City of Ripon v. Ripon Lt. & Water Co.* 5 W. R. C. R. 1, 34.

Analysis of the daily station records of the plant under consideration, together with the statistical information given in the respondent's annual reports to this Commission, will throw considerable light upon the conditions under which the plant is operated and will reveal those facts and relations upon which analysis of the cost of service to the several classes of consumers must largely be based.

The following table presents some of the information thus gained:

TABLE LX.

Year ending	Total output, kw. hrs.	Water power generation, kw. hrs.	Steam power generation, kw. hrs.	Maximum daily output, kw. hrs.	Maximum demand, kws.	Total connected load, kws.
June 30, 1909 (Report)	1,415,257	....	....	5,772	640 (Approx.)	1.536.7
June 30, 1910 (Report)	1,612,760	507,848	1,104,912	6,287	690 (Approx.)	1,662.6
Dec. 31, 1910 (Station records)	1,726,646	416,221	1,310,787	7,061	700	....

There were 133 municipal contract arc lamps reported on June 30, 1910. The connected load of this service was reported as 60.8 kws. The daily station records for the year show a total output for municipal contract lighting as follows. The total use of each circuit is also shown:

	Kw. hrs. output.	Hours running during year.
Circuit No. 1	44,334	2,280
Circuit No. 2	36,604	2,298
Circuit No. 3	48,652	2.901
Circuit No. 4	26,814	3,875
Total	156,404	....

The average send-out per lamp is, then, about 1,176, the average yearly hours burning is about 2,688, and the total connected load is about 59 kws., which closely checks the reported load of 60.8 kws.

Respondent reports the total connected load of the commercial lighting consumers as 967.8 kws. and 1,008.4 kws. on June 30, 1909, and June 30, 1910, respectively. The power load is reported as 568.8 kws. June 30, 1909, and as 654.2 kws. June 30, 1910.

The following table shows the maximum day for each month during the year 1910, with the hour of the demand and the total output for the same day:

TABLE LXI.

MAXIMUM DAYS IN 1910.

Month.	Maximum demand, kws.	Hour of maximum demand.	Total output for day, kw. hours.
January	610	6:00 p. m.	5,121
February	550	5:45 "	6,006
March	480	7:45 "	5,307
April	460	8:00 "	4,474
May	460	8:30 "	4,419
June	425	8:45 "	4,260
July	430	9:00 "	4,212
August	450	8:30 "	4,784
September	460	8:30 "	5,031
October	600	6:15 "	6,144
November	690	5:00 "	6,033
December	700	5:30 "	6,324

It is, of course, a simple matter to determine what portion of the maximum demand on the station is made by the municipal contract lighting system. The demands of the commercial power and commercial lighting systems are not as readily ascertained, however. If the power consumers were all off-peak users, or, in other words, if all the motors were stopped before the evening lighting load came on, then the evening demand would be chargeable entirely to commercial lighting. This is a condition, however, which is not found to exist, especially during the winter months when the lighting peak comes rather early. At such times the power load overlaps to some extent the lighting load and it would be distinctly unfair and inequitable to assess against the commercial lighting service a peak load which is, in fact, increased to a certain extent by the commercial power demand. A careful study of the daily load curves, covering particularly the contrast between the curves for Sundays and other days, the contrast between the curves for summer and winter months, and the drop in the curve at noon and at 5:00 p. m., would indicate that the commercial power system should be charged with from 150 to 170 kws. of the maximum demand.

Careful analysis of the daily load curves of the plant, the connected load and other data indicate that the demand expenses should be distributed on a basis very closely approximating the following: Municipal contract lighting 9 per cent, commercial power (including pumping) 26 per cent, and commercial lighting 65 per cent.

In order to determine the proper basis for a distribution of the items taxes, depreciation and interest, the physical property has been apportioned between the several classes or branches of service. Some items are used by only a single service and may, therefore, be charged directly to that service. Other equipment is used in common by two or more branches of service, and the value of this equipment has been apportioned largely on the basis of the demands made upon the equipment in question by the several classes of service. The separation showed that about 58 per cent of the value of the physical property should be assigned to commercial lighting, 16 per cent to municipal contract lighting, and about 26 per cent to commercial power.

From the apportionments made it appears that the several classes of service should bear the following burdens of expense:

	Output.	Capacity.	Consumer.
Municipal contract lighting	$4,849 38	$3,059 41	....
Commercial lighting	16,976 98	10,671 09	$5,920 24
Commercial power	8,678 91	4,390 31	1,611 60

From the above figures it appears that of the total expenses the three classes should bear the following costs:

Municipal contract lighting	$7,908 79
Commercial lighting	33,568 27
Commercial power	14,680 82
Total	$56,157 88

From these figures it is evident that the reduction in rates must be given to the commercial lighting consumers.

The output cost per kilowatt hour for the current used by the municipal arc lights is about 3.205 cts. The capacity cost is about $23.09 per arc. Multiplying the output cost per kilowatt hour by the number of kilowatt hours consumed per lamp, gives the following total costs per year of the two circuits:

All night lamps	$81.96
Dusk to 1:00 a. m. lamps	56.81

In order to check the above figures, a direct computation of the cost per arc lamp per year has been made. In this computation the municipal contract lighting system has been charged with the current used at the cost per unit of generation, the items of maintenance of arc lamps and lines and poles, trimming and inspecting, etc. A portion of the general expenses has also been charged to this service. Taxes, depreciation and interest have been computed on the basis of the value of the system per arc lamp. Such a computation shows an average lamp cost per year of $62.87. In view of these and other facts, it does not appear that the rate for the arc and incandescent lamps in the municipal contract lighting system should be disturbed at this time.

Based on the total current sold to commercial lighting consumers, with an active load of about 450 kws., the cost curve for this class of service appears about as follows:

COST PER UNIT SOLD.—COMMERCIAL LIGHTING.

Hours daily use	Cost per kw. hr.	Hours daily use	Cost per kw. hr.
1	12.027	10	4.377
2	7.777	15	4.094
3	6.360	24	3.881
5	5.228		

The output cost per kilowatt hour sold is about 3.528 cts. for the commercial lighting service.

The examination of the unit costs suggests the following schedule of rates for incandescent lighting:

12 cts. net or 13 cts. gross per kw. hr. for the first 30 hours' use per month of the active connected load.
7 cts. net or 8 cts. gross per kw. hr. for the next 60 hours' use per month of the active connected load.
4 cts. net or 5 cts. gross for all additional current consumed.

The effect of this schedule upon the monthly bills of residence consumers or those consumers now paying for service under "lighting rate No. 1," is clearly shown in the following table. The computations of the monthly bill under the proposed rate is shown for various active connected loads.

TABLE LXII.

COMPARISON OF NET MONTHLY BILLS OF RESIDENCE CONSUMERS.

Kw. hrs. used per month.	Monthly bill under present lighting rate No. 1.	Monthly bill under proposed rate for active connected load of					
		¼ kw.	½ kw.	1 kw.	2 kw.	5 kw.	10 kw.
1	$1 10	$1 00	$1 00	$1 00	$1 00	$1 00	$1 00
3	1 10	1 00	1 00	1 00	1 00	1 00	1 00
5	1 10	1 00	1 00	1 00	1 00	1 00	1 00
7	1 15	1 00	1 00	1 00	1 00	1 00	1 00
10	1 60	1 10	1 20	1 20	1 20	1 20	1 20
12	1 90	1 26	1 44	1 44	1 44	1 44	1 44
15	2 35	1 50	1 80	1 80	1 80	1 80	1 80
20	3 10	1 90	2 20	2 40	2 40	2 40	2 40
25	3 85	2 23	2 60	3 00	3 00	3 00	3 00
30	4 45	2 48	3 00	3 60	3 60	3 60	3 60
40	5 65	2 98	3 80	4 40	4 80	4 80	4 80
50	6 85	3 48	4 45	5 20	6 00	6 00	6 00
60	7 65	3 98	4 95	6 00	7 20	7 20	7 20
70	8 45	4 48	5 45	6 80	8 00	8 40	8 40
80	9 15	4 98	5 95	7 60	8 80	9 60	9 60
90	9 75	5 48	6 45	8 40	9 60	10 80	10 80
100	10 35	5 98	6 95	8 90	10 40	12 00	12 00
150	13 35	8 48	9 45	11 40	12 90	18 00	18 00
200	16 35	10 98	11 95	13 90	17 80	22 00	24 00
300	22 35	15 98	16 95	18 90	22 80	30 00	36 00
500	34 35	25 98	26 95	28 90	32 80	44 50	52 00
1000	64 35	50 98	51 95	53 90	57 80	69 50	89 00

It will be seen from the foregoing computation that the proposed rate will effect a marked reduction for practically all the residence consumers. Only those residence consumers with an active installation of about 100 16 c. p. lamps or more, and who use more than 70 kw. hrs. per month, will experience any increase in monthly bills under the proposed rates.

The effect of the proposed rate upon the monthly bills of those consumers taking advantage of the "lighting rate No. 2," or business rate, is shown in the following table. In this table the rate is computed for various installations, measured in 16 c. p. or 50 watt lamps. Consumers falling in this class have been considered as having an active load of 60 per cent of the full connected load for the purposes of the computations and comparisons made.

TABLE LXIII.

COMPARISON OF NET MONTHLY BILLS OF BUSINESS CONSUMERS.

Kw. hrs. per mo.	Connected load in 16 c. p. lamp equivalents.									
	10		20		50		100		200	
	Rate No. 2.	New rate.	Rate No. 2.	New rate.	Rate No. 2.	New rate.	Rate No. 2.	New rate.	Rate No. 2.	New rate.
1	$1 62	$1 00	$2 37	$1 00	$4 62	$1 00	$8 37	$1 00	$15 87	$1 00
5	1 77	1 00	2 52	1 00	4 77	1 00	8 52	1 00	16 02	1 00
10	1 96	1 15	2 71	1 20	4 96	1 20	8 71	1 20	16 21	1 20
15	2 14	1 50	2 89	1 80	5 14	1 80	8 89	1 80	16 39	1 80
20	2 33	1 85	3 08	2 30	5 33	2 40	9 08	2 40	16 58	2 40
30	2 70	2 46	3 45	3 00	5 70	3 60	9 45	3 60	16 95	3 60
40	3 08	2 86	3 83	3 70	6 08	4 80	9 83	4 80	17 33	4 80
50	3 45	3 26	4 20	4 40	6 45	5 75	10 20	6 00	17 70	6 00
60	3 82	3 46	4 57	4 98	6 82	6 45	10 57	7 20	18 07	7 20
80	4 56	4 26	5 31	5 38	7 56	7 85	11 31	9 60	18 81	9 60
100	5 33	5 06	6 08	6 18	8 33	9 25	12 08	11 50	19 58	12 00
200	9 08	9 06	9 83	10 18	12 08	14 30	15 83	18 50	23 33	23 00
300	12 83	13 06	13 58	14 18	15 83	18 30	19 58	23 40	27 08	30 00
400	16 58	17 06	17 33	18 18	19 58	22 30	23 33	27 40	30 83	37 00
500	20 33	21 06	21 08	22 18	23 33	26 30	27 08	31 40	34 58	44 00
1000	39 08	41 06	39 83	42 18	42 00	46 30	45 83	51 40	53 33	65 20
2000	76 58	81 06	77 33	82 18	79 58	86 30	83 33	91 40	90 83	105 20

It is apparent that the reduction which can be made to electric consumers in Beloit must largely be given to those consumers who have been paying under the so-called residence rate. No facts have been found in connection with this or other investigations of utilities of this class which warrant the giving of lower rates to business consumers than to residence consumers under the conditions which prevail in Beloit. What has been stated in previous opinions, applies with equal force in this proceeding.

"Petitioner claimed that while the small consumers were on at the time of the peak load that these consumers burned only a small part of their entire installation and that at no time did the occasion arise where dwelling houses used their entire installation at the same time. On the other hand, consumers such as stores used all or nearly all of their lamps at the same time, and this time was coincident with the time of the peak load on the station and consumers of this class were therefore more costly to the plant and should pay higher rates. In other words, the petitioner claimed that the percentage of connected load which is active is larger in the case of stores and similar consumers than is the case for residences and many other small consumers.

That this is true has been demonstrated repeatedly, and is a fundamental feature of correct and scientific rate schedules. The ratio of active connected load or demand to full connected load is an important consideration in determining upon the fair rate schedule." *City of Manitowoc v. Manitowoc El. Lt. Co.* 5 W. R. C. R. 360, 384.

Respondent has submitted in connection with these proceedings statements showing the connected load, classes of consumers, kilowatt hours consumed each month, and revenue for each month for the entire year of 1909, for every electric consumer in Beloit. Tabulations of the data given in these statements showed an average revenue per kilowatt hour from residence consumers of 13.6 cts., from saloons of 5.9 cts., stores 6.7 cts., and hotels 6.4 cts. The facts show quite clearly that the residence consumers in Beloit have been compelled under the existing rate schedule to bear more than their proper share of the cost of the service rendered. Current has been sold to large business users at rates so close to, if not actually below, the cost that residence and other small consumers have been forced to return to the plant most of the profits of the business as a whole. Such a condition is not uncommon in the electric utility business or in other utilities. In the case of Beloit, this situation is found in all three departments of the respondent's business. Such a policy has apparently tended to prevent even a reasonable development of the residence business. That this class of business is profitable when properly developed, has been demonstrated repeatedly.

In form the present rate schedule for business users in Beloit, or the so-called lighting rate No. 2, possesses many advantages and has much to commend it. This rate takes into consideration not only the amount of current used, but also the connected load and demand of the consumer. As previously stated, respondent has submitted statements showing the connected load, together with the current consumed by and the revenue from each individual consumer in Beloit. This material has been very carefully analyzed, and it has been found impossible, in the case of the majority of the business users, to make computations of the revenue under the published rate of the company conform to the actual revenue derived from these consumers. This has been due to the fact that the connected load, as stated by the company on the statements referred to, is not, in the majority of cases, the connected load upon which the rate of the consumer has been computed by the company. It is impossible, in view of these facts, to make computations of such revenues under any proposed rate which will show with absolute accuracy the results which will be secured under the operation of any such rate. In view of these and other facts, it will be necessary to postpone any adjustment of the rate for business users until sufficiently accurate data can be obtained to justify such further adjustment. It is made a part of the order in this case that the respondent shall cause an investigation to be made of the connected load of all its electric consumers. It is further ordered that on all the monthly statements or bills rendered to consumers of electricity in Beloit there shall be stated the connected load of the consumer and the percentage of the same which is considered active.

SERVICE.

The following memorandum has been submitted, of date May 23, 1911, by the service department of the Commission relative to the quality of the gas and electric service rendered by the respondent:

"Numerous inspections of the gas service conditions at Beloit show that the heat value has on all occasions been satisfactory, that the pressure regulation has been within the requirements, and that the meter testing has been carried on in a satisfactory manner. Three complete electric service inspections have been made, which show that, although in a few cases the voltage fluctuation has been outside the requirements, in general the voltage regulation is very satisfactory. These complete inspections have been supplemented by shorter inspections. All inspections indicate that the voltage regulation has been improved within the last two years, that the meters have been tested as required by the rules, and that the service has been very satisfactory."

SUMMARY.

A general summary of the facts brought out in the proceedings and investigation connected with this case, and the findings from these facts, is presented in the following statements:

1. Tentative valuation of Jan. 1, 1909, by the Commission's staff found a cost new of reproducing the physical property of $811,820, and a present value of $733,855.

2. Certain adjustments were made in the tentative valuation as between the three plants. After making these adjustments and other corrections described in detail in this opinion, and after bringing the valuation up to date, June 30, 1910, the valuation of the physical property was found to be as follows:

Water:	Cost new	$307,941
	Present value	289,521
Gas:	Cost new	321,380
	Present value	300,609
Electric:	Cost new	264,882
	Present value	225,772
Total:	Cost new	894,204
	Present value	815,902

3. Consideration of all the objections entered to the value of the different items in the inventory by both the city and the company has not found sufficient ground upon which to base any material departure from the figures assigned to the total property or from the valuation assigned to the three plants after the objections and corrections noted above.

4. It is found that economical and effective operation of the business of the company requires a working capital of about $40,000, including stores and supplies on hand.

5. The company claimed an allowance of $150,000 for the value of the water power controlled and used by it. The city insisted that $50,000 was the maximum amount which could reasonably be allowed for this item. Several methods of determining the value of the water power are discussed and analyzed in the opinion. It is pointed out that from a point of view of public policy it is questionable whether the allowance should exceed the cost of development and value of the physical property utilized.

6. The company's capital liabilities June 30, 1910, were made up of $600,000 of stock and $700,000 of funded debt. Notes and bills payable amounted to $405,000. The company's book value of the same date was $1,696,229.39. The facts in regard to the financing of the present organization, value of tangible and intangible property, among other facts, make it appear that the costs shown by the books of the company do not meet the situation and cannot be regarded as of the greatest importance in these proceedings.

7. From the facts available in regard to the original cost of construction of respondent's plants, the subsequent additions to

the property, its earnings and operating expenses, the development of its business, and other factors, we are inclined to believe that the cost of reproduction is not far away from the values upon which the respondent is entitled to returns that are reasonable under the circumstances.

8. The plants are, as a whole, fairly efficiently and economically operated and maintained. Investment in the gas plant, particularly, however, appears to be somewhat larger than conditions call for.

9. Development of the company's business in all three plants is comparatively poor. This has been shown to be due largely to the design of the rate schedules. Large users have been encouraged by rates which were so close to, if not below, the actual cost of production, as to make it necessary to burden the smaller consumers with high rates in order to secure a reasonable return upon the investment as a whole. This policy has, in turn, tended to discourage the small users and has prevented a reasonably good saturation of territory and that development of the business which would justify the investment made and reduce the unit cost, and thereby the rates for service. It appears reasonably certain that only by fair distribution of the burden of expense between the several classes, and by the granting of reasonable rates to the smaller consumers, can the business in Beloit be developed and the interests of both the public and the company be best served.

10. The water department of respondent's business was found to be earning no more than a 7 per cent rate for interest and depreciation on the present value of the physical property. No material reduction of rates can therefore be considered. It was found that the city was not paying its fair share of the total cost of the service incurred by reason of the fire service and public use of water. Certain large consumers were found to be paying less than the cost of the service rendered them. Metering of a large proportion of the consumers is believed to be the only reasonable and logical solution of the difficulty connected with the operation of the water plant.

11. The value of the gas plant at the end of the year ending June 30, 1910, was about $310,000. The average value during the year is used for the purpose of this decision. The situation in regard to the investment in the gas plant makes it far from clear whether it is equitable to the consumer and for the

best interests of the plant to fix the rates for gas at a figure which will bring a rate for interest and profits on the cost of reproduction as high as may ordinarily be regarded as adequate in plants of this size.

12. The investment in and operating cost of the electric plant are not found to be unreasonable. The development of business is relatively and actually poor, and the rates for residence and other small consumers are found to be unjust and inequitable, and such as to tend to actually discourage a reasonable development of this class of business. For the purpose of the calculations in this decision a return on the valuation of about $270,000 for the electric plant and its proportion of the water power is considered reasonable.

13. The service rendered by the three plants has been carefully watched by the Commission's staff during the past few years and, as a whole, the service conditions can now be said to be reasonably satisfactory and in corformity with the rules and regulations prescribed for utilities in this state.

14. It is difficult to estimate the probable reduction in the revenues of the company which will come as a result of the rates ordered. This difficulty arises from the fact that water consumers in the past have been paying upon a flat rate basis and will in the future pay largely upon a meter basis, and from the situation in the electric department as regards defective data. It is roughly estimated, however, that the immediate reduction to the public, as a whole, in the three plants will amount to about $10,000 or $11,000. The immediate reduction to private consumers will amount to in the neighborhood of $16,000. The metering of water consumers, the development of the business which will come under the new schedules ordered, and the adjustments between classes will undoubtedly bring lower unit cost, and the situation in the future may reveal conditions which will make possible further adjustments and reductions. The situation in the water and electric plants is such that it will be necessary for the Commission to review the facts after a period of a year's operation under the new schedule, when further adjustments may be made.

The facts in these proceedings have been presented very fully in this opinion. It has been deemed important, in view of the situation in Beloit, that careful consideration should be given to all of the elements of the case and that the facts as found should be discussed in detail and presented to the public in such form. Careful consideration of all the elements of capitalization, original cost, cost of reproduction, present value, development of the business, and the various elements affecting each plant as described and discussed herein, together with careful consideration of the distribution of expenses between the several classes of consumers and other features of the situation, lead to the conclusion that the present rates, as a whole, are somewhat higher than warranted under the circumstances; that they are not as equitably adjusted between the several classes of consumers as rates of the kind involved herein should be, and that for these and other reasons the rates complained of and which are now in effect should be replaced by the rates named in the following

ORDER:

It is Ordered, That the respondent in this case, the Beloit Water, Gas and Electric Company, discontinue its present schedule of rates for water service, electric light and power service, and for gas service, and place in effect as a substitute therefor the following rate schedules deemed just and reasonable, as provided under ch. 499, sec. 1797m—46, Laws of 1907:

Schedule of Rates for Water Service.

(payable quarterly in advance)

The company shall install meters at its own expense for all consumers having sewer or cess-pool connection, and shall charge for all water passing through meters according to the following schedule of rates:

1. Service charge, payable quarterly in advance.

⅝ inch meter, one consumer on meter	$1.00
¾ " " " " " "	1.25
1 " " " " " "	1.75
1½ " " " " " "	2.00
2 " " " " " "	3.00
3 " " " " " "	5.00
4 " " " " " "	8.00
6 " " " " " "	15.00
For each additional consumer on the same meter	.50

Each dwelling, flat, suite, store, tenant, etc., shall be regarded as one consumer in determining the service charge.

2. *Output charges.*

10 cts. net or 11 cts. gross per M gallons for the first 50 M gallons used during any one quarter through any one meter.

6 cts. net or 7 cts. gross for the next 75 M gallons used during the same quarter and passing through the same meter.

2 cts. net or 3 cts. gross for all water in excess of 125 M gallons used during the same quarter and passing through the same meter.

3. *Flat rates, payable quarterly, in advance.*

All consumers without sewer or cesspool connection or who are not supplied through a meter shall pay a rate of $1.25 per quarter.

No free service shall be given, and schools, fire station, and other public buildings shall be supplied through meters and shall be charged for water service at the rates above stated.

The city of Beloit shall pay to the respondent the sum of $15,000 each year, in two equal semi-annual installments, for fire protection service. This amount includes the water used for sewer flushing, fountains, and street sprinkling, as these services are at present used by the city.

One year from the date of this order is considered a reasonable time within which the respondent shall have installed all meters required by this order. As soon as a meter is installed on any premises, the meter rate above ordered shall go into effect immediately. The charge to the city for fire protection shall go into effect on Jan. 1, 1912. The company's present rates for street sprinkling done by persons other than the city, and the present rates for water used for building purposes are not disturbed. The matter of past payments due for fire service, the amount of which is in dispute and which has been submitted to the Commission, will be taken up in a separate report.

Where the company is unable to read meter after a reasonable effort, the fact shall be plainly indicated upon the quarterly bill, the service charge assessed, and the difference adjusted with the consumer when the meter is again read.

Discount.

The company shall bill all customers at gross rate and the difference between the gross and net rate above specified, or one cent per 1,000 gallons, shall constitute a discount for prompt payment.

The company's regulations in regard to the last date upon which discount shall be granted for prompt payment shall be stated on the consumer's bill.

Re-Connection of Meters.

For the re-connection of meters for the same consumer upon the same premises a charge of $1 is deemed reasonable.

SCHEDULE OF RATES FOR GAS SERVICE.

For all gas service furnished for lighting, fuel, industrial or power purposes, and passing through meter or meters owned and installed by the company, a charge of $1.25 net or $1.35 gross per 1,000 cubic feet for the first 5,000 cubic feet used during any one month through any one meter; $1.15 net or $1.25 gross per 1,000 cubic feet for the next 10,000 cubic feet used during the same month through the same meter; 90 cts. net or $1.00 gross per 1,000 cubic feet for all gas in excess of 15,000 cubic feet used during the same month and passing through the same meter. The minimum bill shall be graduated according to the size of the meter and shall be as follows:

Size of meter	Amount to be charged each month	Size of meter	Amount to be charged each month
3 light	$0.25	60 light	$1.00
5 "	.25	80 "	1.50
10 "	.35	100 "	2.00
20 "	.40	150 "	3.00
30 "	.50	200 "	4.00
45 "	.60		

Where the company is unable to read the meter after reasonable effort, the fact shall be plainly indicated upon the monthly bill, the minimum charge assessed, and the difference adjusted with the consumer when the meter is again read.

Discount.

The company shall bill all consumers at gross rate, and the difference between the gross and the net rate specified above, or 10 cts. per 1,000 cubic feet, shall constitute a discount for prompt payment. The company's present regulation, that discount for prompt payment shall not be granted after the date or dates of the month as set forth on the consumer's bill and as described thereon, is deemed reasonable.

Maintenance of Burners and Appliances.

Charges for the maintenance and replacement of illuminating burners and appliances shall be reasonable and in accordance with schedule of charges filed with the Railroad Commission.

Re-Connection of Meters.

For the re-connection of meters for the same consumer upon the same premises a charge of $1 is deemed reasonable.

SCHEDULE OF RATES FOR INCANDESCENT LIGHTING SERVICE.

For all lighting service furnished residences and businesses, hereinafter specifically referred to as classes A, B, and C, including such incidental use of appliances for heating or power used on lighting circuits and passing through the same meter and measured by a meter or meters owned and installed by the company, a charge of:

Primary rate: 12 cts. net or 13 cts. gross per kilowatt hour for current used equivalent to or less than the first thirty hours' use per month of the active connected load.

Secondary rate: 7 cts. net or 8 cts. gross per kilowatt hour for additional current used equivalent to or less than the next sixty hours' use per month of active connected load.

Excess rate: 4 cts. net or 5 cts gross per kilowatt hour for all current used in excess of the above ninety hours' use per month of active connected load.

Company's present lighting rate No. 2 shall remain in force and shall apply to all consumers in the down town district, which district is considered as defined in respondent's existing schedule, and shall be optional for the above consumers as under the existing rate.

For all signs, outlines, and window lighting, on a yearly contract basis, hereinafter specifically referred to as class E, a charge of 5 cts. net per active 50 watt equivalent per month, plus 5 cts. net or 6 cts. gross per kilowatt hour consumed, as estimated according to the schedule of hours of lighting now in use by the company.

Active connected load shall in every case be a fixed percentage of connected load, consisting of lamps, appliances, etc., installed upon consumers' premises.

Class A includes residences, dwellings, flats, and private rooming houses. Where a total connected load is equal to or less than 500 watts nominal rate of capacity, 60 per cent of such total connected load shall be deemed active. Where the installation exceeds 500 watts nominal rate of capacity, 33⅓ per cent of such a part of the total connected load over and above 500 watts shall be deemed active.

In class B, where the total connected load is equal to or less than 2½ kilowatts nominal rate of capacity, 70 per cent of such total connected load shall be deemed active. Where the installation exceeds 2½ kilowatts nominal rate of capacity, 55 per cent of such a part of the total connected load over and above 2½ kilowatts shall be deemed active; provided that lamps used exclusively in space devoted to the storing of goods shall be placed at 20 per cent active and shall not be included in the 2½ kilowatts specified above.

Class B shall consist of banks, offices, business and professional, including studios, dressmaking parlors, massage parlors, millinery and hair-dressing establishments, and photograph galleries; wholesale and retail merchandise establishments, such as art stores, bakeries, barber shops, including shoe-shining parlors and public baths, book stores, cigar stores, coffee and tea stores, commission stores, confectionery stores including ice cream parlors, crockery and china stores, dry goods stores, drug stores, electrical supply houses, flower stores including greenhouses, furniture stores, gents furnishing stores including hat stores and haberdasheries, grocery stores, hardware stores, harness shops, hay, grain, feed and coal offices and stores, jewelry stores, meat markets, millinery stores, milk depots, paint and wall paper shops, piano and music stores, picture stores, plumbing shops, saloons including pool and billiard halls and adjoining card rooms: shoe stores and shoe repairing shops, stationery stores, tailor shops including dyers, cleaners and clothes pressing establishments, undertakers, upholsterers, wine and liquor stores, theaters, corridors and halls in office and apartment buildings upon separate meters, dance and public halls including lodge and society rooms, restaurants including eating places and lunch wagons, depots and public places for the conduct of railroads, street railways, express and telephone business excluding freight houses, and all other consumers not herein otherwise specifically provided for.

In class C, where the total connected load is equal to or less than 3 kilowatts nominal rate of capacity, 55 per cent of such total connected load shall be deemed active. Where the installation exceeds 3 kilowatts nominal rate of capacity, 40 per cent of such a part of the total connected load over and above 3 kilowatts shall be deemed active. This class shall include federal and county buildings, churches and missions, hotels and clubs, factories, including small industrial establishments such as machine shops, carpenter shops, blacksmith shops, tin shops and cigar factories, closing not later than 6:00 p. m., private and parochial schools, grain and tobacco elevators and warehouses, freight and storage warehouses, and stables and garages, both private, boarding and livery.

In class D 30 per cent of the total connected load shall be deemed active. Such class shall consist of Beloit College.

In class E the total connected load shall be deemed active. Such class shall consist of unmetered lighting for signs, outlines, and windows, contracted for upon a yearly basis.

Minimum Bills.

The minimum bill shall be $1 net per month. Where company is unable to read meter after reasonable effort, the fact shall be plainly indicated upon the monthly bill, the minimum charge assessed, and the difference adjusted with the consumer when the meter is again read.

Discount.

Company shall bill all consumers at gross rate and the difference between the gross and net rates shall constitute a discount for prompt payment.

The company's present regulation in regard to last discount date is considered reasonable.

Free Maintenance of Lamps.

Company's regulations in regard to renewal of lamps and for the maintenance and replacement of other illuminants shall be reasonable and in accordance with the schedule of charges filed with the Railroad Commission.

Re-Connection of Meters.

For the re-connection of meters for the same consumer upon the same premises a charge of $1 is deemed reasonable.

SCHEDULE OF RATES FOR COMMERCIAL POWER.

For current used for electric power purposes, as measured by meters owned and installed by the company, a maximum charge of 25 cts. net per active horse power capacity per month, plus 4 cts. net or 5 cts. gross per kilowatt hour. Active horse power shall consist of a fixed percentage of the nominal rate of capacity of motor as indicated on the manufacturer's name plate.

The following percentage of such capacity shall be deemed active:

Where installations are under 10 horse power and only one motor is used, 90 per cent.

Where installations are under 10 horse power and more than one motor is used, 80 per cent.

Where installations are 10 horse power or over and less then 20 horse power, irrespective of number of motors, 70 per cent.

* Where installations are 20 horse power or over and less than 50 horse power, irrespective of number of motors, yearly contract basis, 60 per cent.

* Where installations are 50 horse power or over and less than 100 horse power, irrespective of number of motors, yearly contract basis, 55 per cent.

* Where installations are over 100 horse power, irrespective of number of motors, yearly contract basis, 50 per cent.

Installations marked (*) above, on less than yearly contract basis, 70 per cent active.

Minimum bill shall be $1.25 net per month.

MUNICIPAL LIGHTING CONTRACT.

Existing rates for municipal contract lighting by arc or incandescent lamps are not disturbed.

IT IS FURTHER ORDERED, That the respondent shall cause a canvass to be made of all electrical consumers in the city of Beloit to determine the connected load of such consumers.

IT IS FURTHER ORDERED, That all bills rendered by the company to the electrical consumers shall state plainly the connected load of each consumer and the percentage which is considered active in computing the rate.

G. W. JONES LUMBER COMPANY
vs.
CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY.

Decided July 20, 1911.

Petition for refund of demurrage charge accrued on car of lumber at Stoughton, Wis. The car was refused by original consignee and other disposition made of car and demurrage charge of $19 accrued.

Held: **That the agent of the respondent was negligent in not properly looking after the final disposition of the car. Refund ordered.**

The petitioner is a corporation engaged in the manufacture and sale of hardwood lumber. It alleges that on Nov. 21, 1910, it shipped a carload of lumber from Neopit, Wis., to Stoughton, Wis., with directions to deliver the car to the Mandt Wagon Company; that Neopit is situated on the line of the Wisconsin & Northern Railroad, and Stoughton on the line of the respondent railway company; that upon receipt of the invoice the Mandt Wagon Company declined to accept the shipment; that on Nov. 25 a representative of the petitioner arranged with the Stoughton Wagon Company to take the car; that on Nov. 26 the petitioner wrote the respondent's agent at Stoughton as follows: "Please deliver H. V. car 30933 to the Stoughton Wagon Company instead of Mandt Wagon Company as originally instructed. Kindly change our delivery order as above"; that respondent claims that such letter was never received by its agent at Stoughton; that the respondent's agent at Stoughton did not use due diligence in trying to secure instructions for delivery of the car, as the same was held on track from Nov. 26 to Dec. 27, accumulating demurrage, before information reached the petitioner through the agent at Appleton that the car had not been delivered; that the amount of the demurrage accrued on said car and paid by the petitioner amounted to $19; wherefore, the petitioner prays that the respondent be authorized and directed to refund to it the said sum of $19.

The respondent, answering the petition herein, admits all the formal allegations thereof and avers that the shipment in question arrived at Stoughton and was refused by the original consignee and that the respondent did not receive any other delivery instructions and in every way lawfully complied with the instructions it received, and that the imposing of demurrage charges on this shipment was due wholly to the negligence of the shipper itself. Wherefore, respondent prays that the petition be dismissed.

The claim was submitted upon the pleadings, papers, correspondence, and documents on file.

The manager of the Wisconsin demurrage bureau on May 8, 1911, addressed a letter to the petitioner wherein he states the ground upon which the claim was denied as follows:

"We are free to admit that the claim in question carries with it such factors that we do not see our way clear to authorize refund.

"The agent at Stoughton is positive that no re-consigning order was ever received by him, and this coupled with the further factor that in a letter which you addressed to the Mandt Wagon Company under date of November 3rd, quoting as follows: 'Our Mr. Maislein was to be in your city today and he will probably take this matter up with you. We should like to have you unload it if you can do so as we have no other place at present to place it.'

"Under date of Nov. 25, you advised the Mandt Wagon Company as follows: 'Our Mr. Maislein made other disposition of the car No. 30933 loaded with four inch maple.'

"Your Mr. Maislein may have made disposition after effecting sale, but absolutely no re-consigning instructions were given, neither did he call upon the agent."

On account of the conflicting statements contained in the correspondence, it became necessary for the Commission to send its representative to investigate the matter. His report shows that a copy of the letter purporting to have been sent to the agent at Stoughton on Nov. 26 was not cut from a book as intimated by one of the representatives of the respondent, but was cut from a roll of tissue paper used in taking copies of correspondence. Impression on this paper is made by running the paper together with the letter to be copied through a dampened wringer press. After impression is taken, it, together with whatever margin is wanted, is cut off with a knife set on the wringer stand for this purpose. The petitioner writes on an average of about 200 letters per day, tissue copy of each being taken and cut off in the manner described and filed in alphabetical order according to the name of the addressee. The letter in question seems to have been written and copied at the time of its date in the usual manner, and undoubtedly was mailed as claimed by the petitioner. The investigation at Stoughton brought out the fact that the agent there has absolutely nothing to show that any attempt was made to get disposition of the car. The agent stated that he made several attempts but kept no record of what he did, that, however, he did not follow the matter up as he should for the reason that he took it for granted that, through the refusal of the order by the original consignee and the correspondence following that refusal, the shipper was fully informed of the situation. He said that in the light of the present status of this case he was about convinced that he was somewhat negligent in allowing such an amount of demurrage to accrue on the car without greater effort to prevent it on his part. The Stoughton Wagon Works, which finally received the car, states that the material in the car was purchased by it for the reason that it got it at a low price, that it was not wanted for immediate use and therefore it was not interested in and made no inquiries as to when the car would arrive, but that it was prepared to and would unload it without the accrual of demurrage at any time it was placed for unloading.

It is very evident from the situation presented that the agent at Stoughton made but little if any effort to secure the release of the car without the accrual of demurrage. As railroads take the position that the release of cars is of much greater importance than the accrual of demurrage, they expect their agents to make great effort to prevent delay in loading and unloading cars. Had the usual effort in this direction been made in connection with the car complained of, there is very good reason to believe that no demurrage would have accrued on it. From all the facts and circumstances disclosed, we are convinced that the letter ordering the reconsignment of the car was written and mailed by the petitioner and duly received by the agent at Stoughton, who evidently mislaid the same. Under the circumstances the demurrage was erroneously assessed and should be refunded.

We therefore find and determine that the sum of $19 demurrage charge, collected of the petitioner by the respondent, was erroneous and not justified under the circumstances of the instant case.

ORDERED, That the respondent railway company be and the same is hereby authorized and directed to refund to the petitioner the said sum of $19.

IN RE APPLICATION OF THE MARATHON COUNTY RAILWAY COMPANY FOR AUTHORITY TO INCREASE ITS RATES.

Submitted April 27, 1911. Decided July 21, 1911.

Petition for authority to increase rates on the grounds that the rates in effect, which were fixed by the Commission in 1907, are not sufficient to afford a reasonable return on the investment. It was shown that there had been a large decrease in the amount of traffic; that the expenses per ton-mile are much less than that of most other roads of a similar size in the state; that the rates are less than on corresponding lines and that the petitioner is operating at a considerable loss. The petitioner is authorized to increase its rates as ordered.

The petition of the above-named Marathon County Railway Company alleges that the petitioner has in effect upon its line the rates ordered by the Commission in the case of *Streveler v. Marathon County Railway Company,* 1 W. R. C. R. 831, as modified in 2 W. R. C. R. 64, such rates being $4.50 per standard car for distances over eight miles, and $3.50 for distances less than eight miles, and one-half the above rates for "jimmy" or logging cars; and that said rates have not proven sufficiently remunerative to give the petitioner a reasonable return upon its investment. Wherefore, the petitioner prays that the Commission determine and fix a rate for the carriage of freight on the petitioner's line which will be just and reasonable to the petitioner and the public.

The matter was heard at the office of the Commission April 27, 1911. *Goggins & Brazeau* appeared for the petitioner, and *Nicholas Streveler, John McGuire, Jacob Wachtel, Frank Krieg,* and *Burt Oscar* appeared in opposition.

The president of the petitioning railroad corporation testified that the company's actual loss during the past four years has been $4,339.56 in 1910, $4,829.86 in 1909, $1,061.56 in 1908, and $1,600.89 in 1907. This, he said, was the amount by which the road failed to make the expenses actually incurred, including nothing for depreciation and only the payments actually made for interest charges. He stated that the value of the railroad was about $45,000, and thus the interest charges actually paid, ranging from $1,098 to $2,113 per annum, were in no case as high as 5 per cent upon the value of the road. As a part of the petitioner's evidence the following statement of the number of standard and jimmy cars hauled during the calendar years 1907 to 1910, inclusive, together with the revenue received from them, was introduced:

TABLE I.

PETITIONER'S STATEMENT OF CARS HAULED
AND REVENUE OBTAINED THEREFROM.

Cars.	1907.		1908.		1909.		1910.	
	No.	Revenue	No.	Revenue		Revenue	No.	Revenue
Standard:								
At $7.00	63	$441 00	......	....	......	....	......	....
At $5.00	24	120 00	......	....	......	....	......	....
At $4.50	351	1,579 50	594	$2,673 00	317	$1,426 50	469	$2,110 50
At $4.00	4	16 00	......	....	......	....	......	....
At $3.50	57	199 50	242	847 00	171	598 50	166	581 00
Jimmy:								
At $2.50	2,392	5,980 00	......	....	......	....	......	....
At $2.25	465	1,046 25	2,119	4,767 75	1,741	3,917 25	1,386	3,118 50
At $1.75	861	1,506 75	441	771 75	476	833 00	250	437 50
L. C. L. frt	......	37 76	......	36 20	......	....	......	....
Total	4,217	$10,926 76	3,396	$9,095 70	2,705	$5,775 25	2,271	$6,247 50
Pass. rev	......	3 40	......	2 75	......	....	......	....
Switching	......	....	......	....	......	1 00	......	1 00
Demurrage	......	....	......	....	......	8 00	......	....
Total earnings	......	$10,930 16	......	$9,098 45	......	$5,784 25	......	$6,248 50

On the part of the objectors to the application it was testified that the proportion upon which the relative rates of jimmy cars and standard cars were fixed, jimmy cars paying one-half the standard car rates, was unjust, since jimmy cars loaded, by actual calculation in instances mentioned, three-fourths as heavily as standard cars. Since the entire freight business of the R. Connor Company, which virtually owns the petitioner's railroad, is done in jimmy cars which are hauled to the mill at the end of the petitioner's line, while the residents along the line, whose shipments must go beyond the petitioner's line, must use standard cars, it was contended that the relatively low rate on jimmy cars was prejudicial to the inhabitants of the region and beneficial to the real owners of the railroad. One witness gave the relative loading of standard and jimmy cars as fourteen and nine cords of bolts, respectively.

On the other hand, the representatives of the petitioner maintained that the present relation between the jimmy and standard car rates was correct, and that the rates on both kinds of cars should be raised proportionately; and further testified that the cost of hauling standard cars was much greater than that of hauling jimmy cars per unit of weight, for the reason that jimmy cars were moved in trainload lots from common points, while standard cars, containing the shipments of the farmers, had to be picked up here and there along the line, and special trips often were necessary to get them.

According to the reports of the petitioner, filed with the Commission for the calendar years 1907, 1908, 1909, and 1910, the earnings and expenses of the company have been as shown in table II. Calendar years are taken in preference to fiscal years for the reason that the traffic statistics presented in table I and used in a later tabulation in connection with the expenses, relate to calendar years.

TABLE II.

REVENUES AND EXPENSES, MARATHON COUNTY RAILWAY COMPANY.

For Calendar Year.

	1907.	1908.	1909.	1910.
Operating revenues:				
Freight revenues	$10,926 76	$9,095 70	$6,784 25	$6.248 50
Passenger revenues	3 40	2 75	....	....
Total revenues	$10.930 16	$9.098 45	$6.784 25	$6.248 50
Operating expenses:				
Maintenance of way	....	....	$3.104 29	$3.498 56
Maintenance of equipment	....	....	1,001 60	424 89
Transportation expense	....	....	4,611 88	3,294 47
General expenses	....	....	827 51	851 77
Total operating expenses	$11.133 90	$8.393 59	$9.545 28	$8.069 69
Net revenue	....	$704 86	....	....
Net deficit	*$203 74*	....	*$2.761 03*	*$1.821 19*
Taxes	$298 26	$414 45	$414 37	$405 12
Interest payments	1,098 89	1,351 97	1,654 46	2,113 25
	$1,397 15	$1.766 42	$2.068 83	$2,518 37
Total deficit	*$1,600 89*	*$1,061 56*	*$4,829 86*	*$4,339 56*

It appears from table II that the petitioner has at no time since the present rates were made effective, in July, 1907, earned a net revenue which would yield a fair return upon the property invested in the railway. Assuming the fair value of the property to be $45,000, a return of 6 per cent per annum would amount to $2,700 per year, whereas the interest payments actually made have been considerably below that sum, and still there has been a net loss.

It was suggested by the objectors that the petitioner was extravagant in its operating expenses and was in the habit of charging to operating expenses items which should properly be charged to construction. This accusation was emphatically denied by the representatives of the petitioner. In order to compare the expenses of the petitioner with those of other roads in the state of comparable length and density of traffic, it is desirable to arrive at some such traffic unit as car mileage or ton mileage of freight. These units may, in the case of the petitioner, be estimated upon the basis of the number of cars reported by it as having been shipped out upon its line, together with the average loading per car as indicated by the testimony, as follows:

TABLE III.

METHOD OF ESTIMATING TON-MILES OF TRAFFIC.

Cars.	Over 8 miles. Assumed av. 12 miles			Less than 8 miles. Assumed av. 5 miles			Total ton-miles
	No.	Car-miles.	Ton-miles.	No.	Car-miles.	Ton-miles.	
1907.							
Standard (30 ton)................	418	5.016	150,480	81	405	12,150	
Jimmy (20 ton)................	2,857	34,284	685,680	861	4,305	86,100	
	......	39,300	836,160	......	4,710	98,250	934,410
1908.							
Standard (30 ton)................	594	7.028	210,840	242	1,210	36,300	
Jimmy (20 ton)................	2,119	25.428	508,560	441	2.205	44,100	
	......	32,456	719,400	......	3,415	80,400	799,800
1909.							
Standard (30 ton)................	317	3.804	114,120	171	855	25,650	
Jimmy (20 ton)................	1,741	20,892	417.840	476	2,380	47,600	
	......	24,696	531.960	......	3,235	73,250	605,210
1910.							
Standard (30 ton)................	469	5,628	168,840	166	830	24,900	
Jimmy (20 ton)................	1,386	16.632	332.640	250	1,250	25,000	
	......	22,260	501,480	......	2,080	49.900	551,380

The compilation in table III disregards less than carload freight and inbound shipments, since it appears from the information at hand that such traffic is negligible. It is assumed that the average distance of the shipments moving less than eight miles is five miles, and the average distance of those moving over eight miles is twelve miles.

It will be noted that the loading of the jimmy cars has been assumed to be twenty tons, or two-thirds that of standard cars. The petitioner insisted at the hearing that the loading of jimmy cars was only about half that of standard cars; and the same relative loading was considered correct in the order of the Commission in 2 W. R. C. R. 64. The evidence now before the Commission, however, tends strongly to show that the jimmy cars load more than one-half as heavily as the standard cars. The fixing of the rate for jimmy cars at one-half that for standard cars was the result of a hearing supplemental to the original proceeding of *Streveler v. Marathon County Ry. Co.*, and at this supplemental hearing only the Marathon County Railway Company appeared. There was at that time no evidence, such as has now been presented, that jimmy cars loaded more than half as heavily as standard cars. As stated before, it was testified at the hearing in the present proceeding that the jimmy cars loaded, according to one witness' observation, nine-fourteenths, and according to another, three-fourths as heavily as standard cars. Moreover, it was stated that since the order fixing the relation between jimmy and standard car rates, the bunks on the jimmy cars had been built higher, so that they would hold considerably more freight than formerly. It is a further fact that jimmy cars themselves weigh not very much less than the standard cars, and therefore the proportion of dead weight to pay weight is larger in the case of jimmy than of standard cars. Upon a consideration of all these facts, it has seemed advisable to fix the estimated loading of jimmy cars at about two-thirds that of standard cars.

Using the ton-miles obtained in table III as a basis, the expenses of the petitioner have been compared with those of other roads, as shown in table IV. The basis of car mileage would also be valuable for comparison, but the car mileage is less fully reported by the roads than the ton mileage. Since the data from which the ton mileage of the petitioner is computed covers calendar years, the expenses used for that railroad are also calendar year expenses. The expenses for the other roads named are fiscal year expenses as reported by them to the Commission, for the reason that some of the roads do not report ton mileage in their calendar year reports. Whatever error in the comparisons may be caused by this difference is probably sufficiently corrected by the fact that the data cover a continuous period of four years.

TABLE IV.

COMPARATIVE EXPENSE OF OPERATION OF VARIOUS RAILROADS IN WISCONSIN.

Roads.	Total operating expense.	Length miles.	Expense per mile.	Ton-miles revenue freight.	Expense per ton-mile.
1907.					
Marathon Co. R. Co.	$11.133 90	20.25	$549 82	934.410	$0.01192
Chippewa Valley & Northern	15.269 24	15.53	983 21	860,162	.01775
Drummond & S. W.	24,192 44	8.18	2,957 51	612.731	.03948
Fairchild & N. E.	21,337 89	38.00	561 52	429,300	.04970
1908.					
Marathon Co. R. Co.	11.406 58	20.25	563 28	799,800	.01426
Roddis L. & V. Co.	5.342 97	28.00	190 82	345,290	.01547
Tomahawk & E.	6.182 73	20.77	297 68	363,020	.01703
Hazelhurst & S. E.	13.306 29	11.00	1,209 66	647.211	.02056
Wisconsin & Northern	28,264 99	23.00	1.228 91	719,913	.03926
Fairchild & N. E.	17,988 05	38.00	473 37	384,029	.04686
Marinette, T. & W.	41,911 03	[illegible]	1,822 22	574,157	.07300
1909.					
Marathon Co. R. Co.	9,545 28	21.50	443 97	605,210	.01577
Chippewa Valley & Nor.	13,384 25	18.79	712 31	627.742	.02132
Hazelhurst & S. E.	15,171 83	24.20	626 94	523.077	.02900
Tomahawk & E.	10.543 44	20.77	507 63	286.019	.03686
Marinette, T. & W.	26,977 12	23.00	1.172 92	266.856	.10109
1910.					
Marathon Co. R. Co.	8.069 69	21.50	375 33	551.380	.01464
Hazelhurst & S. E	17.491 40	23.90	731 48	689.096	.02538
Tomahawk & E.	11.657 56	20.77	561 27	445,075	.02619
LaCrosse & S. E.	46,324 09	42.61	1,087 16	1.263,301	.03367

It will be seen from table IV that the expenses of the petitioner per road-mile and per ton-mile are in general much lower than the expenses of the other roads of comparable size in the state for which data were available. A complete and accurate comparison of the expenses of the various roads would involve a separation of the expenses of each into movement and terminal expenses and the reduction of these two classes to unit expenses upon different bases. The necessities of this case do not, however, require such apportionments and divisions, since it is apparent from an examination of table IV that the result could hardly be such as to justify the disallowance of any part of the expenses reported by the petitioner.

In addition to being unremunerative to the petitioner, the rates at present in effect appear to be considerably lower than the rates upon other railroads of similar size in this state. The carload rates on a number of the roads included in table IV have been compiled in table V for logs, pulpwood and grain. There is little information at hand to show the character of the traffic upon the petitioner's line, but it is fairly to be inferred from the data available that it consists very largely of forest products, and, to some extent at least, of grain. At any rate, the commodities selected will serve to illustrate the manner in which the petitioner's rates compare with those of other lines. It is assumed, in the case of the petitioner and such of the other roads as quote rates in dollars per car, that the loading of saw logs is 60,000 lbs. per car, of pulpwood 50,000 lbs., and of grain 40,000 lbs. Upon this basis the rates are in each case given in cents per 100 lbs. No rates are given for distances over 15 miles, for the reason that the hauls upon the petitioner's line appear to be in no case longer than that distance.

TABLE V.

COMPARISON OF CARLOAD RATES ON VARIOUS RAILROADS IN WISCONSIN.

Rates in cents per hundred pounds.

ROADS.	Saw logs.			Pulpwood.			Grain.		
	Miles.			Miles.			Miles.		
	5	10	15	5	10	15	5	10	15
Marathon Co. R. Co.[1]	.58	.75	.75	.70	.90	.90	.88	1.13	1.19
Hazlehurst & S. E.	3.00	3.30	4.00	2.00	3.10	3.40	3.50	4.50	5.50
Marinette. T. & W.	2.00	2.20	2.40	1.50	1.64	1.78	3.00	4.00	4.00
Fairchild & N. E.[2]	......	1.00	1.50	2.00	3.00	3.40	3.50	4.50	5.50
Drummond & S. W.[1]	2.50	2.50	......	2.40	2.40	......	3.00	3.00	......
Chip. Val. & N.[1]	.58	.72	1.16	.70	.87	1.40	1.30	1.55	2.00
Roddis L. & V. Co.	3.00	3.25	4.00	2.00	3.00	3.40	3.50	4.50	5.50
Wis. & Nor. R. Co.	[3]1.00	......	[3]1.50	......	[3]1.50	[3]1.50	5.00	5.00	6.00

[1] Quoted on dollars per car: assumed loading, 60,000 lbs. saw logs; 50,000 lbs. pulpwood; 40,000 lbs. grain.

[2] Log rates quoted in dollars per car: assumed loading, 60,000 lbs.

[3] Special commodity rates.

The above table shows that the rates on the petitioner's line are much lower than the rates on other small lines in the state for the commodities named. The objectors to the application, at the hearing and in supplementary letters written to the Commission, dwelt at some length upon the hardship upon them which an increase in the rates would cause. But if the rates now charged fall short of meeting the legimitate expenses of the railroad company and are at the same time considerably lower than the rates on similar railroads in the state, there is no justice in denying the application merely because it will force the shipper in the territory involved to pay a higher rate than they are now paying on the products which they ship out.

As a matter of fact, if they are able to ship forest products to the saw mills and paper mills at a much lower rate than the shippers upon the other small railroads which have been mentioned in the tables preceding, it does not seem at all unfair, in the interest of competition and of the equal development of the northern Wisconsin territory, that the difference in rates should be somewhat lessened.

It is true that the territory served by the petitioner is a new territory, with comparatively sparse population and requiring, so far as it may be practicable, the aid of low freight rates on forest products to enable settlers to clear their land. The lower the point at which the freight rates can be maintained, the more quickly and cheaply will the transformation of wooded lands to farm lands be accomplished. But at the same time the right of the railroad company to earn its operating expenses and have something in addition for a return upon its investment cannot be disregarded. While the special conditions surrounding the traffic and the class of shippers on the petitioner's line may lead to the establishment of rates at a comparatively small margin of return to the petitioner, the situation is not such as to require the road to operate at an actual loss in the interest of the public.

The present rates of the petitioner were fixed by this Commission in July, 1907. At that time the number of cars hauled by the petitioner was much larger than it is now. According to the figures submitted by the petitioner and compiled in table I, the number of cars moved has decreased nearly 50 per cent in four years. This decrease has been most noticeable in the jimmy cars, but the standard cars also, though considerably increased in the first year, presumably partly on account of the decrease in rates, have fallen off about 25 per cent from their movement in 1908. This reduction in number of cars effects a directly proportionate reduction in total revenue, while the decrease in operating expenses has naturally not kept pace with the falling off in revenue.

It is clear, then, that present conditions differ so materially from the conditions in 1907 as to make an increase of the rates over those fixed by the Commission in 1907 not only justifiable, but necessary. At the same time, the information at hand regarding the relative loading of standard and jimmy cars leads to the conclusion that the jimmy cars should pay a larger proportion of the standard car rate than has formerly been the case. The result of this will be that the rate on jimmy cars will suffer a proportionately greater increase than the rate upon standard cars, and the inhabitants of the territory involved, who use only standard cars, will contribute a smaller proportion of the revenues of the road than they have contributed before, though the actual rate charged to them will be somewhat higher.

In fixing the rates for the petitioner's line, it must be borne in mind that with the movement of cars steadily decreasing, any increase of rates which will have the effect of greatly discouraging shippers will result in as great or greater losses of revenue than the present low rates. For this reason it is to the advantage of the petitioner as well as of its patrons that the rate be raised no more than is actually necessary. Upon the whole, it seems that a rate of $6 for standard cars hauled over eight miles, $5 for standard cars hauled eight miles or less. $4 for jimmy cars hauled over eight miles, and $3.25 for jimmy cars hauled eight miles or less, will be fair under the circumstances to the petitioner and the objectors. These rates, upon the basis of the 1909 and 1910 shipments, would pay the entire operating expenses and taxes of the petitioner for those years and would leave almost as much for interest as was actually paid. If the rates were placed any higher, there would be great danger of decreasing shipments so that the actual revenues would be less than they will be under the rates as proposed. The rates above suggested preserve very nearly the relation of two-thirds to one as between jimmy and standard cars, and this relationship is believed, under the evidence now before the Commission, to be fair to all concerned.

IT IS THEREFORE ORDERED, That the petitioner, the Marathon County Railway Company, be authorized to discontinue the rates at present in effect upon its line of railway, and to substitute therefor the following rates: For standard cars, distances over eight miles, $6 per car; distances of eight miles and less, $5 per car. For "jimmy" or logging cars, distances over eight miles, $4 per car; distances of eight miles and less, $3.25 per car.

GEORGE F. MEYER
vs.
RIB LAKE LUMBER COMPANY,
WISCONSIN CENTRAL RAILWAY COMPANY.

Decided July 21, 1911.

RE-HEARING relating to an order issued by the Commission (4 W. R. C. R. 178), requiring the operating, as a common carrier, of a line of railway between Rib Lake and Spirit Falls. The points raised in the re-hearing were: (1) Under the law, has the Commission the power to compel respondents to operate such line as a common carrier, conceding that the facts in the situation presented would justify such an order; (2) if the Commission has this power, is the amount of products to be shipped sufficient to compensate respondent for the cost of furnishing the service demanded, together with a reasonable return upon the investment rendered necessary; and (3) are the rates charged for transporting forest products from near Spirit Falls to Rib Lake and from Rib Lake to Chelsea unreasonable and excessive?

Held: (1) That the railway company can be compelled to operate this line, even though its board of directors failed to pass a resolution making the branch a part of its system under sec. 1831 of the Statutes. (2) That there is a vast amount of timber tributary to the branch and that, while the branch may not be a paying proposition at present, it is an integral part of the railway system and cannot be abandoned so long as the operating revenues of the entire system are adequate to meet all requirements.

The cost of reconstructing the line is discussed, the valuation and the expense of operation. The railway company is ordered to operate one train per week and to put in effect the rates given.

This matter arises on a petition for re-hearing filed by the respondent railway company. The grounds upon which the rehearing was granted were the claims that the respondents had no opportunity to be heard upon the law or facts in the case after the closing of testimony and before the issuance of the order of the Commission; that the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, upon whom the order is in fact made obligatory, has no rolling stock or locomotives which could be operated on the line of railroad involved in these proceedings; that it is impossible to operate said line during the winter months; that to restore ten miles of trackage, which is considerably less than the total involved, would require an expenditure of not less than $18,000; that to operate in accordance with the order of the Commission would involve practically the location and construction of an entirely new line; that no time is fixed in the order of the Commission for the beginning of the service prescribed; that at the time of the hearing respondent relied upon the presence and evidence of persons who were well acquainted with the conditions of said track, but that such evidence was not submitted to the Commission.

A petition to intervene as a petitioner was filed by L. A. Mondeau, a resident of Spirit Falls and a shipper of saw logs, pulp wood, railway ties, and other forest products. This petition sets forth that the Marinette, Tomahawk & Western Railway Company, running from Tomahawk on the Chicago Milwaukee & St. Paul to a point about two miles southwest of Spirit Falls, connects at the point named with the line of railroad operated by respondents from Rib Lake to a point near Spirit Falls, the branch involved in the original proceedings before this Commission. It is alleged further that during the summer of 1908, and at times prior thereto, respondents operated the spur line in question as a common carrier, and the Marinette, Tomahawk & Western has at all times operated and now operates its branch as a common carrier; that respondents have for some time past refused to operate the Rib Lake-Spirit Falls branch as a common carrier and refused to accept shipments from petitioner and others, and have also refused at all times to ship saw logs unless the same were sold and delivered to respondent Rib Lake Lumber Company; that the rates charged for the transportation of pulp wood, cord wood, ties and other forest products from points between Rib Lake and the connecting point near Spirit Falls, and the rates charged for such service between Rib Lake and Chelsea were excessive, unreasonable and unlawful; that by reason of respondents' failure and refusal to accept and deliver shipments, petitioner and others whose forest products are located along the right of way were greatly damaged in being denied the right to market their products at centers located on the main lines of the Wisconsin Central Railway Company. Petitioner prays that the respondents be required to desist from such violation of the acts referred to in said petition, and to operate said line of railroad as a common carrier, and to require the trains operated thereon to make reasonable connection with those being operated on the connecting line of the Marinette, Tomahawk & Western Railway Company, so that through transportation of forest products over said lines may be had; that the reasonable rates of transportation of forest products be ascertained; and that the respondents be required to conform thereto, and for such other and further order and relief as the Commission may deem necessary and just in the premises.

A hearing was held in the office of the Railroad Commission at Madison, Nov. 9, 1909. *W. K. Parkinson* appeared for the petitioner and for L. A. Mondeau, the intervener; *A. H. Bright* appeared for the respondents.

The pleadings and the testimony in this proceeding raise three issues, which logically arise in the order named: (1) Under the law, has the Commission the power to compel respondents to operate the branch road in question as a common carrier, conceding that the facts in the situation presented would justify such an order; (2) if the Commission has this power, is the amount of products to be shipped sufficient to compensate respondent for the cost of furnishing the service demanded, together with a reasonable return upon investment rendered necessary? and (3) are the rates charged for transporting forest products from near Spirit Falls to Rib Lake and from Rib Lake to Chelsea unreasonable and excessive?

With respect to the question of law involved in this case, counsel for respondent points out that under the statute the spur line in question has absolutely no legal existence. Section 1831 requires that no extension shall be made by any railway company unless a resolution of the board of directors authorizing such extension and indicating in a general way its course, be filed with the secretary of state. Since the articles of incorporation of the Wisconsin Central Ry. Co. have never been amended and the board of directors has never properly sanctioned an extension, counsel contends that the branch line involved in this proceeding can in no way be regarded as a part of the respondent's system of railroad. He argued that if the extension is determined to be a part of the Wisconsin Central system, then respondents have failed to comply with the statute directing the manner in which extensions can be made; that the Commission, therefore, by ordering respondent railway company to operate the Rib Lake branch as a common carrier, would compel it to exceed its authority under the statute; and that since it has never complied with the statute cited above, it has no rights under that statute and, therefore, cannot be burdened with any obligation under the same.

On the part of the petitioner counsel maintains that respondent would be estopped from pleading non-compliance with the statute as a defense. He contends that if the respondent railway company's position were upheld, the situation would give rise to unlimited evil practices in the form of discriminations against small shippers of forest products, since the railroad company could make secret agreements, as it has made all over the northern part of the state, with large lumber companies. Under the terms of these secret agreements the railroad company would be relieved from the responsibility of operating these logging railroads as common carriers and all persons who desired to ship out their products from that same locality would be placed at the mercy of the lumber company which is the other party to the contract.

Testimony was submitted by respondent indicating that there never was any thought of building a permanent commercial railroad through that section of the country, even when the branch line was first planned. Officials of the Wisconsin Central stated that to their knowledge such plans of a permanent nature were never contemplated.

Petitioners, on the other hand, point to numerous acts on the part of the railway company which would tend to indicate that there was some idea of building a permanent commercial railroad when this branch was constructed. The matters on which they rely to show this intention on the part of the railway company may be summarized as follows:

a. The track was constructed in a more substantial manner than most logging railroads of a temporary nature are constructed, and the course taken by this extension would not have been taken if the original plan was merely to take out the timber in the territory tributary to the tracks. In the first place, it is shown that logging railroads always follow the line of the least resistance, but that at one point along this extension a cut of fifteen feet was made, when it would have been a comparatively easy matter to have made a slight detour and thus to have avoided this extra cost of cutting. Again, it is shown that heavy, 60 lb. rails were used, whereas the rails on the Marinette, Tomahawk & Western, with which this branch line connects, is constructed of only 35 lb. rails. And yet the Marinette, Tomahawk & Western is regarded in the light of a permanent commercial railroad. Again, the Rib Lake branch extends for something in the neighborhood of one-half mile through low marshy territory. If there had never been any intention of constructing a permanent railroad, the track would certainly have followed more closely the line of timber in that territory.

b. At one time the Wisconsin Central sent its chief engineer on a tour of inspection over the Rib Lake branch and the Marinette, Tomahawk and Western branch, with a view to determine whether it would be advisable for the Wisconsin Central to purchase the Marinette, Tomahawk and Western and maintain a through line between Rib Lake and Tomahawk Junction. This fact, again, is taken to indicate that the original plans were for the construction and maintenance of a commercial railroad.

c. A representative of the Commission who inspected the rate files at Rib Lake and Spirit Falls and also the tariffs on file with the Commission, reports that at one time in the early history of the branch a through rate over the two spurs above mentioned was published by the Wisconsin Central Railroad. No shipments, however, have ever been made under this tariff, but so far as the records of the Commission show, the railway company has never canceled the same. This fact, again, would lend color to the claim that the original intention on the part of the railway company was to operate in this territory as a common carrier.

d. Direct and hearsay evidence was submitted to the Commission to the effect that land agents of the Wisconsin Central have sold tracts of land in the vicinity of this railroad, holding out as an inducement to prospective purchasers that settlers would have access to permanent railroad facilities. A pamphlet published by the Wisconsin Central Railway Company was introduced in evidence which exploited the attractive features of farm land in Price and Taylor counties. In this pamphlet is reproduced a small map showing the main line of the Wisconsin Central. The entire branch from Chelsea through Rib Lake to Spirit Falls is represented by the same heavy line given to the main line of the railroad. This is mentioned as another fact tending to indicate that the Wisconsin Central regarded the Rib Lake-Spirit Falls branch as a permanent part of its system.

In the situation thus presented, the crucial question for determination is whether the respondent railway company is legally obliged to operate the branch line in question as a part of its railway system. As we understand the railway company's contention in the premises, it matters not what steps it may have taken with a view of operating such branch line as a common carrier, it cannot be compelled to do so because of its failure to comply with the provisions of sec. 1831 of the Statutes which reads as follows:

> "Before making such extension or building any such branch road such corporation shall, by resolution of its directors, to be entered in the record of its proceedings, designate the route of such proposed extension or branch in the manner provided in section 1820, and file a copy of such record, certified by the president and secretary, in the office of the secretary of state and cause the same to be recorded as provided in said section 1820. Thereupon such corporation shall have all the rights and privileges to make such extension or build such branch and receive aid thereto which it would have had if it had been authorized in its charter or articles of organization."

In this connection our attention is directed to the language of the supreme court in *Eastern Railway Co. v. McCord,* 136 Wis. 249, where the failure of a railway company to take the steps prescribed in the statute quoted was under consideration as a bar to condemnation proceedings instituted by it. Although in the proceedings before the Commission upon the application of the railway company for a certificate of convenience and necessity literal compliance with such statute was proven, such proof seems not to have been made in the condemnation proceeding. The court, therefore, acting upon the assumption that the preliminary step required by the statute had been omitted, said:

> "This step is very essential in order that it may assume the obligation and inform the State of its intention to accept the rights and perform the duties of a common carrier and that it proposes to conduct this public business over such designated branches and extensions. Since the company has not complied with the conditions of secs. 1831 and 1820, Stats. (1898), appellants, as property owners whose land is sought to be condemned for the use of the railroad, can insist that this proceeding to condemn and take their land for such use be dismissed."

Counsel for the railway company, commenting upon the case cited, says:

"From this case it is very clear that passing and filing the resolution is an absolute condition precedent to the railroad becoming a common carrier. The Commission has no authority to allow this step to be dispensed with, nor can it remedy the lack of such a resolution by granting a certificate of convenience and necessity. It is submitted that neither can it dispense with this vital statutory step by an *order* to operate as a common carrier. Suppose an order should be made to operate this track as a common carrier and it then appears that the lumber company had not obtained good title to some of the right of way and that condemnation proceedings were necessary. We would then have a Railroad Commission common carrier that has no standing in court—a public carrier before the Commission, but a private logging road before the supreme court of the same state."

Perhaps the only answer to the argument of counsel is that the statute was enacted for the benefit of the public and not for the benefit of railroad corporations, and, therefore, the public alone can complain of its violation. A corporation usurping a franchise may be restrained from its exercise in an action brought on behalf of the state. Also persons, where property is sought to be taken by the corporation under eminent domain, may successfully contend that the corporation is acting beyond its powers. This was the view taken in the case of the *Rib Lake Land Co. v. Upham Mfg. Co.* 1. W. R. C. R. 739, 766, where it was said:

"We do not think the company has relieved itself of any duty which it owed to the public as a common carrier, by neglecting to take the preliminary steps provided for by statute, and we do not think it is in any position to claim immunity by reason of its failure to do what we think it should have done before building the extension in question, and we believe that the railway company under its contract is in precisely the same position it would be if in fact it did build it."

It has been urged that as the question was not fully discussed in the *Upham Mfg. Co.* case, we should not hesitate to withdraw from the position therein taken. If we were convinced that such holding were wrong, our duty in the premises would be clear, but in view of the fact that the question is not free from doubt, we believe that we should adhere to the former ruling, leaving it to the courts to determine the correctness or incorrectness of the same.

The question whether the amount of the products available for shipment will be sufficient to justify the investment required to put the branch in operating condition, and the further cost of operating trains over the same, was deemed material by the parties, and conflicting estimates were offered to sustain the contention of the parties respectively.

The testimony of witnesses for respondents and for petitioner differ materially as to the amount of forest products still available for shipment in the vicinity of the Rib Lake branch. A former woodsman and timber estimator for the respondent lumber company testified that twenty-eight signers of the original petition live in town 34, range 3 east, and own about 2½ million feet of timber which would be just as well and even better served by the Knox Mills spur of the "Soo" road than by the branch in question. In the same town and range 42 signers own a little over three million feet of timber which is best served by the Rib Lake branch. Fifteen signers live near or at Spirit Falls very close to the Marinette, Tomahawk & Western line, five live in town 35, near the main line of the "Soo" or near Spirit Falls, and six live near Rib Lake. The entire yield of the territory tributary to the Rib Lake branch, in his estimation, would not exceed 5 million feet of timber. This amount corresponds to about 1,050 carloads of logs, or 350 carloads of lumber. He reports the land adjacent to the branch to be mostly cut-over railroad land which, after the little timber that is left has been removed, will yield nothing more than a little cordwood.

The testimony of the petitioners showed that other facilities than the Rib Lake branch were not as acceptable to the signers of the petition as the testimony of the respondents' witness would indicate. This testimony was to the effect that the distances given by the witness are in the nature of direct air line distances, and that, on account of the topography of the country, the natural drain of all this territory is toward the Rib Lake branch. The country appears to be extremely hilly and roads are not always cut through, so that wide detours are at times encountered in reaching what would appear to be, according to air line measurement, the nearest facility. It was further pointed out that respondents' testimony was based on the assumption that the timber owned by the various settlers was located at their places of residence and the testimony thus given, therefore, errs to the extent that many of the signers have timber holdings far removed from their places of abode but close to the Rib Lake branch.

With respect to respondents' testimony that the timber lands are mostly cut-over railroad lands, it was stated that only so much of the lands as were controlled by the Wisconsin Central Railway Company and the Rib Lake Lumber Company were actually cut-over lands. Practically all of the remainder is still virgin forest with the exception that here and there the pine has been removed. The general view of the situation given by a representative of the Commission would tend to corroborate this claim.

The actual amount of timber still to be cut is variously estimated by the different witnesses. Whereas the respondents witness estimates 5 million feet to be the maximum, one witness for petitioner states that the amount will easily reach from 40 to 50 million feet, and that at least three years of operation under practically heavy load will be required to market all of the product.

Another witness for petitioner, a timber estimator and buyer and a practical logging road builder, estimates the amount still available in the territory immediately adjacent to the branch at 100 million feet, and if an ancillary spur were installed about five miles southeast of Spirit Falls, fully another 100 million feet could be reached. The first 100 million feet is mostly in town 34, range 3 east, and does not include the smaller forest products, such as ties and pulp. The detailed estimate of timber immediately accessible to the present branch of railroad is as follows:

Stewart Lumber Company	52,000,000	feet
Vollmer & Buelow	16,000,000	"
Oelhaven	20,000,000	"
Tillman	18,000,000	"
Bradley (about)	65,000,000	"
Farmers' (settlers, etc. about)	45,000,000	"

The United States Leather Co. owns about 70 million feet which would be best served by the ancillary spur. This witness further testified that if proper connection were made with the Marinette, Tomahawk and Western, large shipments would be made from the other end of the Marinette, Tomahawk and Western branch through Spirit Falls and Rib Lake to points on the main line of the Wisconsin Central. About 2,000 cars annually would be shipped in this manner.

It must be conceded upon any view of the testimony that there still exists a vast amount of timber tributary to the branch in question, but it does not necessarily follow that such timber will be cut and shipped to market at the present time. Doubtless many years will elapse before all the timber is removed from this territory, and many more years will pass before the lands will be devoted to agriculture. Such branch will not be anything but a source of expense to the railway company in maintaining and operating the same at present, but this is immaterial if it be an integral part of its system, for the system must be operated as a whole and no part thereof may be abandoned because it does not pay, at least so long as the operating revenues of the entire system are adequate to meet all requirements.

The next point to be considered is the matter of the investment required to properly repair the branch. The former chief engineer of the Wisconsin Central Railroad Company testified that originally the branch was laid out and constructed in a very superficial manner and that it is very much inferior to the ordinary logging railroad. At present, for the first four miles north of Rib Lake, the ties and track are in fairly good condition, but that for the rest of the distance 90 per cent of the ties are rotten and underbrush has grown up to the height of from three to four feet. To put the track in such condition that it would be possible to handle freight as it would be handled over the average logging railroad, would require an expenditure of $57,000. No passenger traffic could be handled with such an expenditure and only so much alignment would be changed as would be necessary to operate with safety any logging railroad. To handle the products as they were estimated in the original decision of the Commission, would require rolling stock to the value of $31,400. The rails and fastenings already installed are estimated at $2,800 per mile. This item added to the above would make the total investment involved $131,520. On the other hand, if the respondent should be required to maintain a railroad of a more permanent character, the cost of the repair and reconstruction would reach $190,520, and the total investment, including the value of rails and fastenings as estimated above, would reach $233,640.

The total cost of operating the branch is estimated by the engineers at $20,403.50 a year. The details of this total are as follows:

Interest		**$6,576.00**
Taxes		**1,500.00**
Maintenance of way		**4,620.00**
Maintenance of equipment		**1,155.00**
Conducting transportation:		
Superintendence	**$1,200.00**	
Wages	**3,812.50**	
Fuel, etc.	**1,540.00**	**6,552.50**
		$20,403.00

Although the prayer of the petitioner in the original proceeding was for only one trip each week, it is estimated by respondents that in order to move all the products as estimated in the original order of this Commission, 250 trips a year, of 10 cars to a train, would be necessary. At the rate of $5 per car, 2,543 cars would produce a total revenue of $12,615. Comparing this figure with the estimate of expenses given above, it is found that the net loss each year to the respondents would reach $7,788.50.

So far as the general condition of the track and roadbed at present is concerned, the testimony of all the witnesses for the petitioner coincides with the testimony of the respondent railway company's officials, but the estimates of what it would cost to place it in fair operating condition are radically different. A representative of the Commission who viewed the premises states that all that would be necessary would be to install about 20,000 new ties and ballast the track on the average of a depth of six inches, and to line it up and probably do a little gauging. He reports that there are two good gravel pits in the immediate vicinity and that ties are sold at 23 cts. along the right of way. These factors would tend to keep the cost down to a minimum and it would not require more than $10,000 to put the eleven miles of track which need repairing in fair condition for a good logging railroad.

A witness who has had practical experience in the construction of logging railroads, testified that the branch is generally of better construction than the logging roads with which he is familiar, and that the maximum original cost of construction of a branch of this class would be from $800 to $1,000 per mile, and an expenditure of from $200 to $300 per mile would put the branch in good condition or at least render it adequate to carry engines of a 50 ton capacity, hauling from ten to fourteen cars at a speed of twelve miles per hour. He estimates that about 2,300 ties would be used to a mile and that the cost of laying, including the cost of ties, would not exceed 30 cents each.

A practical surveyor and engineer stated that the branch compared very favorably with any logging railroad, although it could not have cost to exceed $1,000 per mile in the original construction. He recollects that trains of twenty-five cars have been run over this branch by running twelve at a time as far as Kruger's Hill and combining the two sections from this point down to Rib Lake. With an expenditure of $300 per mile, he thinks that trains of fifteen cars each could be hauled over it at the rate of twelve miles an hour. At the outside an expenditure of from $500 to $600 per mile would put the entire branch in the same condition in which we now find the first four miles beyond Rib Lake. By comparison with other roads supposed to be of a like standard, he testified that engines of 65,000 lbs. capacity haul trains of thirty cars over roads of no better grade or general construction. The only point of disadvantage on the branch is the fact that there are some small knolls requiring a 3 per cent grade of track, but it was the witness's opinion that the cost of cutting down these knolls and putting the track down to a better grade would more than pay for itself in more economy in operation.

The estimate of the railroad company is predicated upon the basis of reconstructing the line according to its standard of branch line construction, while the other estimates to which reference has been made merely contemplate such improvements and repairs as will be necessary to the safe operation of the branch as a logging railroad. The former estimate is for a better line than the present needs of the public for railroad facilities in that vicinity warrant. Nevertheless, if the road is to be maintained and operated as a common carrier, it would not be in the interest of economy to make temporary repairs or to omit any work required to place the road in a reasonably substantial operating condition. To properly reconstruct the road will require the expenditure of a larger sum than the estimates offered in behalf of petitioners seem to indicate. As already stated, except for the obligation resting upon the company to operate the extension as a part of its system regardless of the expense, it could not be compelled to do so if returns on the investment were the criterion of its duty in the premises.

The matter of rates, both over the branch and the M. T. & W., were complained of. The M. T. & W. is said to refuse to accept shipments altogether, unless the timber or material has been sold to certain buyers. Over the branch it was shown that the rate to Rib Lake is $7.50 per car, and from Rib Lake to Chelsea $2.40 additional. From that point to the point of destination the regular tariff rates prevail, and if the shipment is destined for some private track at the market, an extra charge for switching of $2.50 is exacted. Testimony was also given as to the prices paid for logs and other products at Spirit Lake and at competitive points. At Spirit Lake the following prices prevail:

12 to 14 ft. logs	$5.00
16 ft. logs	5.50
18 to 20 ft. logs	6.50
Bark	7.50
Ties	23 to 28 cts.
Pulp—spruce	6.00
" —hemlock	2.25

At a competitive point on the North Western line, only 28 miles distant, logs bring from $10 to $16.

No data of any kind are available as to the value of the branch in question or the cost of operating it. Therefore, the only method of testing the estimates submitted by the respondent as to the cost of operation is by way of comparison with the cost upon similar roads operating under like conditions.

On the matter of valuation, the figures submitted by the respondent indicate that the entire cost of the 15.4 miles of line, when put in condition for operation, will be about $131,520, or $8,540 per mile. Using the valuation figures of the joint engineering staff of this Commission and the tax commission, the value per mile of various small railroads in this state has been compiled as shown in table I. The roads named in this comparison were selected with a view to obtaining conditions as nearly as possible like those upon the branch in question. Thus, all of the roads handle forest products in greater volume than anything else, and all are devoted almost exclusively to freight traffic.

TABLE I.

COMPARISON OF VALUATIONS OF SMALL RAILWAYS HANDLING MOSTLY FOREST PRODUCTS.

Road	Valuation 1910.	Total track miles.	Valuation per mile.	Tonnage of forest products, per cent of whole.	Freight earnings, per cent of whole.
Ashland. O. & M............	$95.000	33.00	$2,879	97.63	100
Chip. Val. & N...............	33.000	18.70	1.756	74.28	98
Davis Lbr. Co................	54.000	22.50	2.400	100.	100
Drummond & S. W..........	70.000	21.10	3.318	98.83	100
Dunbar & W..................	75.000	13.50	5.556	....	100
Hazelhurst & S. E..........	30,000	24.90	1.205	92.17	99
Laona & Northern............	40.000	18.00	2.222	....	95
Marathon County...	36,000	21.50	1.674	100.	100
Marinette. T. & W...........	65,000	30.25	2.149	61 90	90
Robbins R. R.................	50.000	28.00	1,786	100.	100
Roddis L. & V. Co..........	22,000	15.00	1,467	100.	100
Tomahawk & E...............	60.000	21.82	2,750	83.94	94
Whitcomb & Morris.........	10.000	7.09	1.410	....	100
Wis. Northwestern	55,000	44.80	1,228	....	96
Total	$695.000	320.25	$2,170	....	....
Maximum..................	....	....	5.556	....	....
Minimum..................	....	....	1,205	....	....

Table I shows that the average valuation of the roads included therein is $2,170 per mile. A number of the roads named are mere logging roads, while others are regular passenger and freight railroads handling large quantities of forest products. It would seem entirely fair to estimate the valuation of the branch line in question, when completed as a first-class logging road, at $4,000 per mile. This figure is considerably higher than the average, and is considered sufficiently high to permit of the rehabilitation of the present road in a satisfactory manner. At this figure, the entire valuation of the line will be about $61,600.

As to operating expenses, in order to make intelligent comparisons with other railroads in the state, it is necessary to obtain for the line herein involved certain traffic statistics. These statistics must necessarily be only an estimate, but they are the result of a careful examination of the testimony in the case and are not believed to be far out of the way. It seems that the business to be developed upon the line will require the running of a train three times a week the year around. The testimony conflicts as to the number of cars which can be handled in each train, but a fair average would probably be fifteen. An examination of the timber estimates in various parts of the testimony, and of the other facts available, indicates that considerably the larger part of the traffic will move from the last five miles of the line, while about half as much will originate in the next five miles, and a relatively small part will come from the five miles nearest the main line of the "Soo" railway. These estimates are necessarily rough, and there is considerable chance for variation either way, but, regarded as estimates merely, they will serve as a basis for estimating car mileage. The average length of the hauls originating in the first five miles is estimated at three miles, for the next five miles at eight miles, and for the next five and four-tenths miles at fourteen miles. The average in each case has been placed somewhat above the middle point of each section, for the reason that products situated within a mile or so of the dividing line of two sections are likely to move across the line to the section having the lower rate, rather than to a nearer point on the section having the higher rate. Using the above estimates as a basis, the following estimated traffic statistics are obtained for the line in question:

Trains per year	156	
Cars per year, moving out	2,340	
Cars moving first 5 mi., 10% of total	234	
Loaded car-miles (3 mi. per car)		702
Cars moving second 5 mi., 30% of total	702	
Loaded car-miles (8 mi. per car)		5,616
Cars moving third 5.4 mi., 60%	1,404	
Loaded car-miles (14 mi. per car)		19,656
Total loaded car-miles		25,974

The cost of maintenance of way and structures, as estimated by the respondent companies, is $300 per mile, or $4,620 per year for the entire line. Table II indicates the manner in which this estimate compares with the actual results for various Wisconsin lines.

TABLE II.

COMPARISON OF MAINTENANCE OF WAY EXPENSES.

Name of road.	*Year ending June 30, 1910.*			*Year ending June 30, 1909.*			*Year ending June 30, 1908.*		
	Expense.	Total track miles	Expense per track mile.	Expense.	Total track miles	Expense per track mile.	Expense.	Total track miles	Expense per track mile.
Ashland. O. & M.	$27,492 06	33.00	$833 09	$21,507 19	29.00	$741 63	$19,342 23	28.50	$678 67
Chippewa Val. & N.	3,721 39	18.79	198 05	2,681 80	18.79	142 72	....	......	....
Drummond & S. W.	9,052 19	21.10	429 01	5,690 19	21.10	269 68	6,893 23	21.10	326 69
Dunbar & Wausaukee	790 20	13.50	58 53	10,018 08	13.50	742 08	9,419 64	13.50	697 75
Hazelhurst & S. E.	1,562 05	24.90	62 73	1,897 83	14.70	129 10	1,382 36	14.70	94 04
Laona & Northern*	2,907 87	22.00	132 18	2,651 69	18.00	147 32	1,904 44	16.00	119 03
Marathon County*	3,498 56	21.50	162 72	2,437 63	21.50	113 38	4,159 80	20.25	205 42
Marinette, T. & W.	13,529 00	30.25	447 24	8,733 37	30.25	288 71	8,522 76	30.25	281 74
Mattoon Railway	4,719 59	29.36	160 75	4,496 79	29.36	153 16	6,201 68	29.36	211 23
Robbins R. R.*	3,072 76	22.25	138 10	621 92	28.00	22 21	11,769 66	28.00	420 35
Roddis Lbr. & V. Co.*	1,310 29	15.00	87 35	770 66	16.25	47 42	679 98	12.50	544 00
Tomahawk & Eastern	3,642 92	21.82	166 95	4,875 57	21.82	223 45	2,793 41	21.82	128 02
Whitcomb & Morris	1,485 50	7.09	209 52	1,203 50	7.09	169 75	1,941 00	6.00	323 50
Wis. Northwestern	3,657 23	44.80	81 63	1,859 43	44.80	41 51	2,931 80	34.00	86 23
Average	....	.....	$226 28	....	......	$230 87	....	......	$315 90
Maximum	....	......	833 09	....	......	742 08	....	......	697 75
Minimum	....	......	58 53	....	......	22 21	....	......	86 23

*1910 statistics are for calendar year.

The combined average cost of maintenance of way for the three years is about $256 per mile. Under all the circumstances, it does not seem unfair to place the figure for maintenance of way at about $300 per mile, thus permitting the respondent's estimate to stand unchanged.

The cost of maintenance of equipment is estimated by the respondent company upon the basis of train-miles, and is placed at 15 cts. per train-mile, or $1,155 per annum. For present purposes a more convenient and satisfactory unit is the loaded car-mile, and upon this basis the maintenance of equipment cost for a number of railways in Wisconsin has been compiled, as shown in table III. It will be noted that the railways used in the comparison below are not in all cases the same as those named in previous tables. This is due to the lack of car mileage statistics on most of the smaller lines in the state, making it necessary to resort to somewhat larger lines for comparative data. A number of these roads are so largely devoted to passenger traffic that it is necessary to arrive at the freight proportion of the maintenance of equipment expense in order to make the roads at all comparable to the freight line in question. Such of the maintenance of equipment expenses as relate wholly to freight service, as for example freight car repairs, require no modification, while such as relate entirely to passenger service are disregarded altogether. The remainder, consisting mostly of the locomotive expenses, have been divided upon the ratio of total freight car-miles to total car-miles. The resulting maintenance of equipment expenses chargeable to freight traffic are as shown in table III:

TABLE III.

COMPARISON OF MAINTENANCE OF EQUIPMENT EXPENSES.

Name of road.	*Year ending June 30, 1910.*			*Year ending June 30, 1909.*		
	Expense chargeable to freight.	Total loaded car-mile.	Expense per car-mile.	Expense chargeable to freight.	Total loaded car-mile.	Expense per car-mile.
Abbotsford & N. E.	....	....	....	$339 47	43,898	$0.0077
Ahnapee & Western	$2,999 92	39,886	$0.0752	3,319 38	148,902	.0223
Ashland, O. & M.	....	....	....	9,802 07	125,073	.0784
Hazelhurst & S. E.	3,210 57	77,499	.0414	880 32	74,560	.0118
Iola & Northern	413 42	6,620	.0625	160 42	5,992	.0268
Kewaunee, G. B. & W.	17,318 98	339,154	.0511	16,556 86	318,765	.0519
Marathon County	424 89	24,340	.0175	1,001 60	27,931	.0359
Marinette, T. & W.	6,713 39	245,144	.0274	4,180 87	28,198	.1483
Mineral Point & N.	7,095 33	94,630	.0749	7,815 52	85,183	.0917
Stanley, M. & P.	28,384 05	233,545	.1215	12,763 69	182,032	.0701
Tomahawk & Eastern	2,052 17	33,488	.0613	733 77	8,476	.0866
Wisconsin & Michigan	20,384 36	248,873	.0819	22,783 83	281,157	.0810
Wisconsin & Northern	3,101 97	140,178	.0221	3,936 52	86,301	.0456
Average	....	....	$0.0579	....	....	$0.0583

The average cost of maintenance of equipment per loaded car-mile, as deduced from table III, is 5.81 cts. for the years 1909 and 1910. The expense per car-mile varies greatly among the different roads, and in some cases there is a marked difference on the same road as between the two years. On the whole, considering the small size of the line in question and the fact that it is not expected to be operated as a standard branch line but merely a logging road, a charge of 5 cts. per loaded car-mile would seem to be sufficient. The resulting total for the year, $1,298.70, is somewhat higher than the estimate made by the respondent company.

The expenses of conducting transportation are divided by the respondent's estimate into superintendence, train wages, and fuel, supplies, etc. Superintendence is placed at $1,200 per year. If this sum is intended to represent only the cost of superintendence of transportation, it is much higher than is usually necessary for a line of as light traffic as the one in question. It is probably intended, however, to include the entire management cost of the line, and if such is the case it is probably not excessive. It is therefore allowed to remain as estimated by the respondent, but is placed under the head of general expense.

The company's estimate of the train wages is as follows:

1 engineman at	$4.00
1 fireman "	2.50
1 conductor "	3.75
2 brakemen "	5.00
Total per train	$15.25
250 trains	$3,812.50

This estimate assumes that 250 trips per year will be made, whereas the most that the evidence indicates to be necessary is a service of three trains a week. It is upon this service that the estimated traffic statistics given above are based, and as a result the number of trips must be changed from 250 to 156. Moreover, the wages assumed by the company's estimate are higher than the average for the intrastate roads in this state. The average daily wage of enginemen, firemen, conductors and trainmen on such roads for the year 1910, as shown in the 1910 report of this Commission, pages 229 to 231, are: enginemen, $3.48; firemen, $2.18; conductors, $2.88; other trainmen, $2.77. Having regard to the conditions in the territory under consideration and the fact that the averages above given are increased considerably by the presence of several of the larger intrastate roads in the compilation, it seems that the following estimate is fair:

1 engineer	156	days	at	$3.50	$546.00
1 fireman,	156	"	"	2.00	312.00
1 conductor,	156	"	"	2.50	390.00
2 brakemen,	312	"	"	2.25	702.00
Total					$1,950.00

The above total appears the more fair to the respondent company when it is considered that the respondent is already operating the line from Chelsea to Rib Lake, and the extra trip three times a week over the 31-mile distance may not constitute a full day's work. In such case, part of the train wages in the above estimate would be chargeable to the Chelsea-Rib Lake branch.

The item of fuel, supplies, etc., is estimated by the company at 20 cts. per train-mile, or a total of $1,540. Table IV compares these costs for the various roads used in previous tables, on the basis of loaded car-miles:

TABLE IV.

COMPARATIVE COST OF FUEL, SUPPLIES, ETC.

Name of road.	*Year ending June 30, 1910.*			*Year ending June 30, 1909.*		
	Expense chargeable to freight.*	Total loaded car-mile	Expense per car-mile	Expense chargeable to freight.*	Total loaded car-mile	Expense per car-mile
Abbotsford & N. E.	....	....	....	$2,658 44	43,898	$0.0606
Ahnapee & Western	$5,486 22	39,888	$0.1375	4,205 10	148,902	.0282
Ashland, O. & M.	....	....	....	8,125 19	125,073	.0649
Hazelhurst & S. E.	4,667 95	77,499	.0602	4,559 56	74,560	.0612
Iola & Northern	715 34	6,620	.1081	665 40	5,992	.1110
Kewaunee, G. B. & W.	8,930 78	339,154	.0263	8,499 81	318,765	.0267
Marathon County	1,733 69	24,340	.0712	3,351 88	27,931	.1200
Marinette, T. & W.	7,279 24	245,144	.0297	2,886 08	28,198	.1023
Mineral Point & N.	9,945 94	94,640	.1051	10,116 21	85,183	.1188
Stanley, M. & P.	6,318 33	233,545	.0271	5,993 93	182,032	.0329
Tomahawk & Eastern	2,304 16	33,488	.0688	1,298 25	8,476	.1532
Wis. & Michigan	14,024 98	248,875	.0564	21,269 79	281,157	.0757
Wis & Northern	8,213 99	140,178	.0586	6,945 59	86,301	.0805
Average	....	....	$0.0681	....	....	$0.0797

*Total of accounts Fuel, Water, Lubricants, and other supplies for road locomotives, Train supplies and expenses, Stationery and printing, Other expenses, as apportioned to freight department.

Table IV shows a large variation in the cost of the items named, per loaded car-mile. The cost runs from less than 3 cts. to over 15 cts. If the cost for the line in question is placed at 7 cts. per loaded car-mile, the resulting total, $1,817.18, will probably represent a fair approximation of the actual cost, and will allow to the railway company upon this item a little more than its estimate.

Combining the estimates for each division of the expenses, and adding taxes at about the prevailing rate and interest at 6 per cent upon the valuation as estimated above, we arrive at the following table of annual expenses for the line in question:

TABLE V.

ESTIMATED EXPENSES OF THE RIB LAKE-SPIRIT FALLS BRANCH.

Operating expenses:	
Maintenance of way and structures	$4,620.00
Maintenance of equipment	1,298.70
Conducting transportation:	
Wages of trainmen	1,950.00
Fuel, supplies, etc.	1,817.18
General expenses	1,200.00
Total operating expenses	$10,885.88
Taxes, 0.0112 on $61,600 valuation	689.92
Interest, 6% on $61,600 valuation	3,696.00
Total expense	$15,271.80

In determining upon the rates which are to be fixed for the line in question, it must be borne in mind that the commodities to be moved out are in many cases relatively low grade commodities; that the territory through which the line runs is little developed and it is to the interest of the railway company as well as of the shippers that it be developed as rapidly as possible; and that the line is to be, to all intents and purposes, a branch of the Minneapolis, St. Paul & Sault Ste. Marie Railway and as such need not, as a matter of good railway economics, be highly profitable in itself. These and other circumstances lead to the conclusion that if rates are so fixed as to pay operating expenses and taxes upon the line, and a little additional as interest upon the investment, the railway company will have obtained all that it can fairly ask.

The Rib Lake-Spirit Falls branch, consisting of 15.4 miles of track, has thus far been considered as a separate entity in estimating its value and the probable cost of its operation. But in fixing rates for this branch, the fact that it is a continuous part of a line through to Chelsea must be considered. If the rates were fixed from various points to Rib Lake, and a uniform amount were added on all shipments for the haul from Rib Lake to Chelsea, the result would be that the Rib Lake-Chelsea portion would receive exactly the same revenue per mile from the longest hauls on the road as for the shortest, while the remainder of the line, beyond Rib Lake, would be subject to the principle that as the haul increases the revenue per mile should ordinarily decrease. Thus, if the uniform rate from Rib Lake to Chelsea were fixed at $2.50, and the rates beyond Rib Lake were fixed at $2.50 for the first five miles and $4.50 for ten miles, the five-mile line from Rib Lake to Chelsea would earn

50 cts. per mile per car on all hauls, while the line beyond would earn 50 cts. per mile for hauls of five miles, and 45 cts. per mile for hauls of ten miles.

The present rate between Rib Lake and Chelsea, a distance of five miles, is $2.50 per car upon shipments destined to points on the "Soo" line. Adopting this as the rate for five-mile distances on the combined Chelsea-Rib Lake and Rib Lake-Spirit Falls line, and $4.75 for the ten-mile rate, $7.00 for the fifteen-mile rate, and $9.00 for the twenty-mile rate, we may arrive at an estimate of annual earnings for the respondent's line as shown in table VI. In this table the 15.4 miles of line under consideration are considered to be entitled to such proportion of the entire rate for each distance as the length of haul over this line bears to the combined haul over this line and the Rib Lake-Chelsea line.

TABLE VI.

ESTIMATED EARNINGS OF THE RIB LAKE-SPIRIT FALLS BRANCH.

234 cars moving first 5 miles at $4.75 for entire haul; branch entitled to $2.38	$556.92
702 cars moving first 10 miles at $7.00 for entire haul; branch entitled to $4.66	3,285.30
1,404 cars moving first 15 miles at $9.00 for entire haul; branch entitled to $6.75	9,477.00
Total earnings	$13,319.22

As a matter of fact, it is generally true that the part of a railroad which originates traffic is entitled to a greater proportion of the total rate than is represented by its mileage, but without making any addition to the estimated income on this account, it will suffice to present the final estimate of earnings and expenses of the line, as follows:

Operating revenue	$13,319.22
Operating expenses	10,885.88
Surplus from operation	$2,433.34
Taxes	689.92
Net revenue available for interest, etc.	$1,743.42

The rates above proposed are in the nature of arbitraries, to be added to the regular rate to Chelsea on the "Soo" line. So far as the information at hand goes, practically all of the shipments made over the branch line are destined to points on the "Soo" line and few stop at Chelsea. Therefore, in order to compare the proposed rates with other rates now in effect, the basis of comparison must be the amount charged on branch lines on shipments moving beyond the branch; or, in other words, the excess of the through rate from the branch line point to some point of destination, over the rate from the junction point of the branch to the same destination. Table VII shows the class rates established for two branch lines of the "Soo" railway, comparable in length with the line in question considered as one branch from Chelsea to Spirit Falls. The table gives the rates in cents per 100 lbs. for each class of freight between Chicago, Milwaukee and Manitowoc, and the various points on the branches, including the points of junction with the main line:

TABLE VII.
CARLOAD CLASS RATES ON M. ST. P. & S. S. M. RAILWAY, TO BRANCH POINTS.
RATES IN CENTS PER HUNDRED POUNDS.

To and from	Chicago.						Milwaukee.						Manitowoc.					
	Miles.	Classes.					Miles.	Classes.					Miles.	Classes.				
		A	B	C	D	E		A	B	C	D	E		A	B	C	D	E
Abbotsford	306	24	19	16	13	13	214	21	16	14	12	10	161	20	14.5	11.5	8.5	8
Athens	321	25	20	17	14	13	229	23	18	15	13	12	176	20.5	15	12	9	8
Goodrich*	332	25	20	17	14	12	240	23	18	15	13	12	187	20	15	12	9	8
Marshfield	284	23	18	15	12	11	192	20	14	11	8.5	8.5	139	18.5	13	10.5	8	7.5
Mohle	289	23	18	15	12	11	197	21	16	13	11	10.5	....	....	....	....	....	...
Vielkind	294	23	18	15	12	11	202	21	16	13	11	10	....	....	....	....	....	....
Spokeville	297	23	18	15	12	11	205	21	16	13	11	10	....	....	....	....	....	....
Loyal	301	23	18	15	12	11	209	21	16	13	11	10	156	20	14	11	8.5	8
Greenwood	306	23	18	15	12	11	214	21	16	14	12	10	161	20	14.5	11.5	8.5	8

*All Goodrich rates above quoted, except the class E rate from Milwaukee (which is the Wisconsin distance tariff rate for 240 miles), are subject to addition of $3.50 per car.

As appears from table VII, there is little uniformity in the extra amount charged between the branch line points and Chicago, Milwaukee and Manitowoc, over and above the charge from the junction point to the same destinations. For example, on the Greenwood branch all the points have the same rate as Marshfield, their junction point, to and from Chicago, while to and from Milwaukee the same points take a rate higher by from 1 to 2 cts. per 100 lbs. than their junction point. If it be assumed, as seems to be fair for purposes of comparison with the other branches, that the average loading on the branch line involved herein is at least 50,000 lbs. per car, the extra charge on the Greenwood branch is from $5 to $10 per car for the various distances. Similar branch line charges may be deduced from an examination of the tariff for the Goodrich branch. The rates shown in table VII are presented merely by way of illustration of the manner in which rates to branch line points compare with the arbitraries suggested for the line in question here, and not by any means as a complete comparative table.

On the whole, it seems that the rates already suggested are fair to the shippers and to the railway company, and compare satisfactorily with other branch line rates, and should be put into effect between points on the Spirit Falls branch as the arbitraries applying to and from Chelsea on shipments coming from or going to the main line of the "Soo" railway.

The movement of less than carload freight to and from the branch line involved in this case does not appear to be at all extensive, but as no system of rates would be complete which did not include rates on less than carload freight, it is deemed advisable to fix such rates also. The present less than carload rates to and from points on the Chelsea-Rib Lake branch are fixed by adding the following arbitraries to the Chelsea rate on the main line:

	Classes.			
	1	2	3	4
Cents.............	5	4	3	2

If these rates are left as the five mile rates, the following rates for 5, 10, 15, and 20 miles, to be used as arbitraries for less than carload freight on the Spirit Falls branch, are perhaps not out of proportion:

Miles.	Classes.			
	1	2	3	4
5..................................	5 cts.	4 cts.	3 cts.	2 cts.
10..................................	6 cts.	5 cts.	4 cts.	3 cts.
15..................................	6.5 cts.	5.5 cts.	4.5 cts.	3 cts.
20..................................	7 cts.	6 cts.	5 cts.	4 cts.

As to local shipments which do not go beyond this branch, there appears to be little traffic movement. Rates for such shipments will necessarily be considerably higher than the arbitraries heretofore fixed on through shipments. Table VIII shows local rates on two of the typical products of the territory herein involved, on several small railroads in the northern part of Wisconsin, applying on carload shipments:

TABLE VIII.

COMPARISON OF LOCAL CARLOAD RATES ON LOGS AND PULP WOOD ON NORTHERN WISCONSIN ROADS.

Rates in dollars per car; where quoted by railroad in cents per cwt., loading of 60,000 lbs. logs, and 50,000 lbs. pulp wood is assumed.

Roads.	Logs.				Pulp wood.			
	Miles.				Miles.			
	5	10	15	20	5	10	15	20
Mar. T. & W.	12.00	13.20	14.40	15.60	7.50	8.20	8.90	9.60
Dunbar & Wau.[1]	8.25	8.25	8.25	....	10.00	10.00	10.00	....
Drummond & S. W.[2]	12.00	12.00	....	....	12.00	12.00	....	....
Chip. Val. & N.	3.50	[3]4.33	[3]7.00	....	[3]5.20	[3]6.20	8.00	....
Haz. & S. E.	18.00	19.80	24.00	27.00	10.00	15.00	17.00	19.00
Roddis L. & V. Co.	18.00	19.50	24.00	27.00	10.00	15.00	17.00	19.00
Wis. & Northern	[3]6.00	[3]6.00	[3]11.25	[3]15.00	15.00	20.00	[3]7.50	[3]7.50
Average	11.11	11.87	14.82	21.15	9.96	12.34	11.40	13.78

[1] Logs quoted at $1.65 per M; assumed loading, 5 M per car.
[2] Pine logs $15.00 per car.
[3] Average of special commodity rates.

A consideration of the general trend of the local rates on northern Wisconsin railroads, both the carload rates, as shown in the table above, and the less than carload rates, which are quite uniform among the roads, leads to the conclusion that the following rates for local shipments upon the Spirit Falls branch will not be far from the usual level, especially when the small quantity of traffic is considered.

LOCAL RATES, SPIRIT FALLS BRANCH.

Miles.	Classes. Cents per 100 lbs.				Carloads, per car.
	1	2	3	4	
5	9	8	7	6	$7 00
10	12	10	9	8	9 50
15	15	12	10	9	12 00
20	18	15	12	10	14 00

Of the above local rates, the less than carload rates are the regular distance rates of the Minneapolis, St. Paul & Sault Ste. Marie Railway for the distances named.

Now, Therefore, it is Ordered, That the respondent Wisconsin Central Railway Company and its successor, the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, operate not less than one train on one day in each week between Rib Lake and Spirit Falls, proper and sufficient notice of the place and time of arrival and departure of said train to be given according to law.

It is Further Ordered, That the respondent Wisconsin Central Railway Company and its successor, the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, shall cease and desist from charging any higher rates for transportation either way between Spirit Falls and Rib Lake and intervening points than as follows:

On shipments destined beyond or coming from beyond Chelsea, and for forest products milled at and re-shipped from any point on the Rib Lake line, the following arbitraries will be added to the Chelsea rate for the Spirit Falls branch:

	Classes. Cents per 100 lbs.				Carloads, per car.
	1	2	3	4	
5 miles and under	5	4	3	2	$2 50
10 " " over 5	6	5	4	3	4 75
15 " " " 10	6.5	5.5	4.5	3	7 00
21 " " " 15	7	6	5	4	9 00

On local shipments on Spirit Falls branch:

	Classes. Cents per 100 lbs.				Carloads, per car.
	1	2	3	4	
5 miles and under	9	8	7	6	$7 00
10 " " over 5	12	10	9	8	10 00
15 " " " 10	15	12	10	9	12 50
21 " " " 15	18	15	12	10	15 00

IN RE APPLICATION OF THE MORRIS TELEPHONE COMPANY FOR AUTHORITY TO INCREASE ITS RATES.

Decided July 22, 1911.

Application for authority to put in effect a rate of 50 cts. per month and subscribers furnish instruments. The probable earnings under the proposed rate are so low that the propriety of granting the rate cannot be questioned.

The Morris Telephone Company in its application sets forth that its present rates consist of toll charges of 10 cts. from Bowler and Tigerton to various points, and that it requires all subscribers to own one share of stock and to furnish their own instruments. It desires to put into effect a charge of 50 cts. per month for all subscribers, requiring them, as in the past, to furnish their own instruments.

A hearing was set for May 15, 1911, but no appearance was entered on behalf of the application or in opposition.

The applicant is a rural company with two one-party business subscribers and two farm lines, on which are in all 28 subscribers. It reports its plant investment to be $1,100, and its earnings and expenses to be as follows:

1910:	Total operating earnings	$10.50
	Total operating expenses	2.20
	Net earnings	$8.30
1909:	Total operating earnings	$2.45
	Total operating expenses	18.60
	Net deficit	*$16.15*

The total present deficit of the company, as appears from its balance sheet for June 30, 1910, is $155.58.

The proposed rate of 50 cts. per subscriber per month will yield a gross revenue of about $180 per year from subscribers, which, with the present toll revenue of about $10 per year, will make the operating earnings of the company about $190 per year. The operating expenses, as reported by the company, are so abnormally low as to suggest that much labor and expense properly chargeable to the telephone company is furnished gratuitously by its officers. The probable earnings under the proposed rate are not so high as to cast any doubt upon the propriety of putting the new rates into effect.

The provision in the present schedule, that all subscribers must own a share of stock in the applicant company, is of doubtful legality, but it is not considered necessary at the present time to pass upon the matter. It will undoubtedly be made the subject of investigation at a future date.

It is Therefore Ordered, That the applicant, the Morris Telephone Company, be and the same is hereby authorized to add to its present schedule of rates a monthly charge of 50 cts. per subscriber.

IN RE APPLICATION OF THE OZAUKEE-WASHINGTON TELEPHONE COMPANY FOR AUTHORITY TO INCREASE ITS RATES.

Submitted July 11, 1911. Decided July 26, 1911.

Application for authority to adjust and equalize rates, three telephone companies, having separate schedules, having consolidated. The valuation of the property, the revenues and expenses are discussed. It is shown that under the proposed rates the legitimate expenses, including taxes, depreciation and interest on the estimated valuation at 7%, will at least equal the estimated income. Application granted.

The Ozaukee-Washington Telephone Company, a newly organized consolidation of the Freistadt-Cedarburg, Grafton, and Mequon telephone companies, states in its application that the lawful rates at present in force upon its lines are as follows:

Freistadt-Cedarburg Telephone Co.:

Residence or farm	$9 per annum
Business	12 per annum
Non-subscribers	10 cts. per call.

Mequon Telephone Co.:

Residence or farm	$12 per annum
Business	18 per annum
Rent of one instrument by six subscribers	36 per annum.

Grafton Telephone Co.:

Single line business—$18 per annum, including free connection with Wis. Tel. Co.

Single line residence—$12 per annum, plus 5 cts. per message for connection with Wis. Tel. Co., and subject to annual discount of $2 if paid for one year in advance.

In order to equalize the rates over its entire system, the applicant desires to put into effect the following rates:

Party lines, residence or farm	$12 per annum
Party lines, business	15 per annum
Single lines, residence, farm or business, not over ½ mi. in length	18 per annum
Non-subscribers, per call	10 cts.

Single lines, residence, farm, or business, exceeding ½ mi. in length, extra charge to be made for construction and maintenance.

A hearing was held at the office of the Commission, July 11, 1911, at which the applicant was represented by *Michael O'Connor*. No one appeared in opposition.

The three telephone companies which have been consolidated into the applicant company have all been in operation some eight or nine years, and serve, for the most part, rural patrons. The formal consolidation took place in the early part of 1911, though the stockholders of the Freistadt-Cedarburg Company had bought out the other two companies during 1910. The present applicant has, according to the testimony, between 1,000 and 1,500 miles of wire line, and about 550 subscribers, of whom about 200 are business and the remainder residence and farm subscribers. Only about thirty of the telephones are on single lines, the remainder being on party lines with from seven to thirteen phones on a line. Since the consolidation between ten and fifteen miles of new line have been built, about 100 new subscribers have been secured, and a new central office has been erected at Grafton at a cost of about $3,000.

The value of the three properties now consolidated has been reported to the Commission at various times as follows:

	Freistadt-Cedarburg.	Grafton.	Mequon.	Total.
Report, June 30, 1909	$7,295 00	$5,141 03	$5,776 64	$18,212 67
Report, June 30, 1910	13,600 00	5,932 28	*6,000 00	25,532 28
Testimony, July 11, 1911	15,000 00	11,000 00	9,000 00	35,000 00

*December 31, 1909

The above figures show that the total valuation reported by the companies has increased nearly $10,000 in the past year, and over $7,000 in the year preceding. The estimated valuation of $35,000, on the basis of 550 present subscribers, amounts to about $63.63 per subscriber, which is somewhat higher than the average for plants of this character. On the whole, it would seem that the estimated increase of nearly $10,000 is somewhat excessive, and a total plant valuation of $32,000, or about $58 per subscriber, is sufficient for the purposes of this case. A more detailed valuation of the plant is not considered necessary at this time.

The operating revenues and expenses of the three companies have not in all cases been satisfactorily reported, and as a result it is difficult to arrive at the normal financial operations of the present company as a whole. The reports of the Mequon company have been sufficiently detailed as to both earnings and expenses, but, for the year ending June 30, 1910, end with

May 1, the date upon which the plant was transferred to stockholders of the Freistadt--Cedarburg Telephone Company. The Freistadt--Cedarburg Telephone Company's reports show only earnings and expenses in a lump sum, and the Grafton Telephone Company made no report at all for the year ending June 30, 1910, the reason, as reported to the Commission at that time, being the loss of records. A statement submitted at the hearing purports to show the total revenues and expenses of the three companies for the year ending Dec. 31, 1910. The results of these various statements are shown in table I:

TABLE I.

EARNINGS AND EXPENSES.

	Freistadt-Cedarburg.	Mequon.	Grafton.	Total.
1. Year ending Dec. 31, 1910 (as reported at hearing.)				
Operating revenue	$2,927 58	$1,220 14	$1,396 18	$5,543 90
Operating expense	1,305 72	511 18	1,083 48	2,900 38
Net revenue	$1,621 86	$708 96	$312 70	$2,643 52
2. Freistadt-Cedarburg, year ending June 30, 1910; Mequon, 1 year on basis of report for July 1, 1909, to May 1, 1910; Grafton, year ending Dec. 31, 1909.				
Operating revenue	$2,671 61	$1,637 11	$2,358 63	$6,667 35
Operating expense	2,345 91	1,718 70	1,518 16	5,582 77
Net revenue	$325 70	....	$840 47	$1,084 58
Net deficit	....	$81 59	....	....
3. Year ending June 30, 1909.				
Operating revenue	$1,690 59	$1,413 09	$1,347 28	$4,450 96
Operating expense	913 55	1,505 44	1,235 09	3,654 08
Net revenue	$777 04	....	$112 19	$796 88
Net deficit	....	$92 35	....	....

As the table shows, the operating expenses of the three companies varied quite considerably during the three periods. This is brought out more fully by the following table showing the expenses per subscriber:

TABLE II.

OPERATING EXPENSES PER SUBSCRIBER.

	Period 1: 1910.			Period 2: 1909-1910.			Period 3: 1908-1909.		
	Expense.	Subscribers.	Per subs.	Expense.	[illegible]	Per subs.	Expense.	Subscribers.	Per subs.
Freistadt-Cedarburg....	$1,305 72	240	$5 44	$2,345 91	[illegible]	$8 72	$913 55	236	$3 87
Mequon....................	511 18	115	4 44	1,718 70	[illegible]	15 34	1,505 44	75	20 07
Grafton....................	1,083 48	90	12 04	1,518 16	[illegible]	16 87	1,235 09	90	13 72
Total....................	$2,900 38	445	$5 58	$5,582 77	[illegible]	$12 41	$3,654 08	401	$9 11

So great is the variation in the expense per subscriber, running from $4.44 to $20.07 in the case of a single company, that it is doubtful whether the expenses as reported can be accepted for their face value. The reports show so little detail that it is impossible to ascertain whether operating and construction items have been kept properly separated; and in the case of the Mequon company, as reported for the period ending Dec. 31, 1910, the low figure at which the expenses have been placed leads to a doubt whether the report covers the whole year or only that part of it, from May to December, succeeding the change in management.

By way of arriving at an idea of the normal expense per subscriber of companies similar to the one in question, table III has been compiled, showing the operating expenses, subscribers, and expenses per subscriber of a number of companies in the state. Most of the companies having as many subscribers as the applicant do little or no rural business, and are therefore not as accurately comparable with the applicant as companies whose installations are largely rural. For this reason, companies were selected for the table which averaged about the same percentage of rural subscribers as the applicant, namely, about 55 per cent.

TABLE III.

OPERATING EXPENSES OF VARIOUS TELEPHONE COMPANIES.

Year ending June 30, 1909.

Location.	Subscribers.	Expenses.	Expense per subscriber.	Rural subscribers, per cent of total.
Baldwin	325	$1,358 83	$4 18	67
Bloomer	445	3,122 07	7 01	45
Chippewa Falls	483	4,423 30	9 16	58
East Troy	399	3,706 81	9 29	100
Elroy	343	2,866 07	8 36	49
Kilbourn	392	2,533 13	6 46	64
Lime Ridge	400	4,950 00	12 38	86
Mt. Horeb	433	2,432 84	5 62	70
Orfordville	352	1,701 60	4 83	72
Osceola	420	1,457 28	3 47	90
Osseo	440	2,000 83	4 55	73
Pardeeville	374	1,724 73	4 61	74
Prairie du Sac	802	6,423 54	8 01	83
Rice Lake	588	2,442 57	4 15	60
River Falls	518	4,337 57	8 37	46
Sparta	757	4,635 97	6 12	53
St. Croix Falls	412	3,606 63	8 75	61
Westby	412	2,385 42	5 79	66
Total	8,295	$56,109 19	$6 76	

The operating expenses as shown in table III for the various companies do not include taxes or depreciation. If taxes are included, as they are undoubtedly included in the reported expenses of the applicant, the average expense will be $7.02 instead of $6.76 per subscriber. This figure of $7.02 is considerably lower than the average figure for the applicant for the three periods covered by table II. The cost per subscriber for the first period, the year ending Dec. 31, 1910, is unusually low, while that for the other two periods must be regarded as unusually high, if it includes only items properly chargeable to operation. It is not safe to place too much dependence upon comparative figures, such as those shown in table III, since, especially in the telephone business, conditions vitally affecting the cost of operation differ so greatly as between different exchanges and different parts of the state. For example, of two rural telephone companies one may serve a much more compact community than the other, with resulting lower cost of maintenance. In this case, considering the facts that in the telephone industry, contrary to the result in other public utilities, an increase of patrons does not mean a decrease in expense per patron, that the number of subscribers of the applicant is somewhat larger than the average in the compilation given above, that the applicant's lines cover a considerable extent of territory, and that its subscribers have increased somewhat in number since the date of the latest cost statistics, an estimated operating expense of $3,850 per year, including taxes, does not seem unfair to the telephone company upon the one hand or to its patrons on the other. This is an average cost of about $7.00 per subscriber, which, though almost $1.50 higher than the reported cost for the calendar year 1910, is much lower than the other statements of the applicant's expenses and corresponds very closely to the general average obtained in table III.

The item of depreciation, as explained in previous decisions, may safely be fixed at about 7 per cent per annum in the case of telephone plants, and interest upon the investment is usually allowed at about the same rate.

In order to arrive at the probable earnings of the applicant under the proposed rates, it is necessary to ascertain the number of installations which will come under each rate. The reports of the three companies comprised in the applicant company are not sufficiently complete to furnish this separation, and the number of new subscribers added since the latest report would in any case make the figures unsatisfactory. The approximate figures given at the hearing will, therefore, be used. It appears that there are about 200 business subscribers, 30 of whom have single line phones while the remainder are on party lines. The remaining 350 instruments are on farm and residence lines, all of which are party lines.

Since the reports of the three companies are not, in most cases, given in detail, it is generally impossible to ascertain exactly how much revenue each company has been receiving from sources other than instrument rentals. However, if the rate for each kind of telephone is multiplied by the number of instruments installed by each company, the revenue from instrument rental may be approximated, and the remainder of the revenue reported may be assumed to be derived from connecting lines and from such other sources as non-subscribers' calls. Such miscellaneous revenue seems to amount to between $900 and $1,000 per year for the three companies.

Table IV shows the probable revenue and expenses of the applicant if the proposed rates are put into effect:

TABLE IV.

PROBABLE REVENUES AND EXPENDITURES OF APPLICANT.

REVENUES:

Revenues from subscribers:	
30 single line business phones at $18	$540
170 party line " " " 15	2,550
350 " " residence " " 12	4,200
Miscellaneous revenues	950
Total revenues	$8,240

EXPENSES:

Operating expenses, including taxes	$3,850
Depreciation, 7% on $32,000	2,240
Interest, 7% on $32,000	2,240
Total expenses	$8,330

Table IV shows that the legitimate expenses of the applicant under the proposed rates will at least equal the estimated income, and perhaps will be somewhat in excess. In view of this showing, there is no reason why the application should not be granted. As compared with other telephone rates in the state, the proposed rates appear to be properly proportioned, considering the character of the applicant's business. The 10 ct. charge for non-subscribers is not an increase, since the schedules of all three of the companies, as filed with the Commission, provide for such a charge. The extra charge for single party lines more than half a mile long is intended, according to the testimony, to vary with distance, and in view of the small amount of demand for single party lines in the rural districts, this extra charge will not in all probability have to be made often. Any disputes as to the justice of such charges when made can easily be settled by the Commission.

IT IS THEREFORE ORDERED, That the applicant, the Ozaukee-Washington Telephone Company, be and the same is hereby authorized to discontinue its present schedule of rates, tolls and charges and to substitute therefor the following schedule:

Party lines, residence and farm telephones	$12 per annum
Party lines, business telephones	15 per annum
Single lines, residence, farm or business telephones not to exceed one-half mile in length of line	$18 per annum
An extra charge to be made for construction and maintenance where single lines exceed one-half mile in length.	
Non-subscribers, per call	10 cts.

WISCONSIN TELEPHONE COMPANY
vs.
CITY OF LA CROSSE.

Submitted Jan. 30, 1911. Decided July 26, 1911.

Petition alleging that a resolution and order of the authorities of the city of La Crosse, requiring the removal of petitioner's poles and wires from South Front street is grossly unreasonable, arbitrary, discriminatory, invalid and void. It appears that this street has been permanently paved by the city and considerable money was expended in improving it and adjoining property used for park purposes; that it is a driveway overlooking the Mississippi river; that the beauty of the street is greatly marred by the unsightly poles that line both sides; that the poles could be moved, without much difficulty, to adjoining streets and alleys; that in case of fire, difficulty and danger might be incurred by the fire department in reaching the fire, because of numerous wires strung upon the poles in close proximity to the buildings.

Held: That the right given to telephone companies by sec. 1778, to construct and maintain their lines upon, in, along, across, or beneath the surface of any public road or highway, is subject to all reasonable regulations by the municipality, and in the exercise of its police power the municipality may, in a proper case where public safety, necessity or convenience requires, order the removal of telephone or electric poles from any thoroughfare, and the wires to be placed in conduits or the poles to be moved to another location; that the order which the petitioner is required to comply with does not call for the laying of the wires in conduits, but the removal of poles and wires to adjoining streets, alleys or private rights of way, the expense of which would not render the regulation unreasonable and would be no more than commensurate with the public convenience resulting from the change; that the demand for the removal of the poles is not unreasonable under the circumstances; that the resolution is a reasonable regulation and valid.

The petition alleges that the petitioner was and now is a corporation duly organized and existing under and by virtue of the laws of the state of Wisconsin, and duly and lawfully engaged in the business of owning, operating, and managing a plant and equipment within the city of La Crosse, and at a large number of points in the state of Wisconsin, for the conveyance of telephone messages, and engaged in the business of furnishing telephone service, both through exchanges in various cities, including the city of La Crosse, and also over a system of toll lines, and that said toll line service so rendered includes service within the state of Wisconsin, and also service in connection with the lines of other companies to and from others of the United States; that the petitioner's telephone exchange system in the city of La Crosse has existed there for more than twenty years, and that for all the said period said petitioner has maintained in La Crosse apparatus and equipment for telephonic communication between subscribers in different cities and communities, which service is commonly known and is hereby described as "toll line service"; that the apparatus and equipment used by petitioner in the city of La Crosse, both for its exchange and its toll line service, has at all times been maintained at the highest standard known to the art and is of the best and most efficient character, and that such equipment includes approximately fourteen miles of conduits containing underground cable in the business section of the city, containing over 1,800 miles of wire, and aerial cable containing over 1,500 miles of wire; that all of said cable is used exclusively for exchange purposes; that all of the toll wires are open wires strung on poles and that it is mechanically impossible in the present state of the art to furnish efficient toll service for the distance necessarily involved in communication over the petitioner's wires to and through the city of La Crosse by any known system of wiring, except only the system used by the petitioner in La Crosse of stringing aerial open cable wires; that as a part of its general plan of operation in La Crosse petitioner has for a large number of years maintained a system of poles and cables and wires along and on South Front street, along the boulevard thereof from Johnson street to Tyler street, and on Third street from Johnson street to Mississippi street in the said city of La Crosse; that all the poles on said streets were lawfully erected at times in or prior to the year 1900 and have been maintained and operated there ever since, and that said poles bear aerial cable and wires for exchange service and also open copper wires for toll service, and that such wires for toll service are used for communication between the city of La Crosse and other cities and places, and also for communication between other places, the wires for the conduct of which must necessarily pass through the city of La Crosse, including communications between points outside of the state of Wisconsin.

That on or about Aug. 27, 1909, the mayor and common council of said city of La Crosse adopted a resolution authorizing the board of public works of said city of La Crosse to order the removal of all telephone and other poles on South Front street along the boulevard thereof, from Mississippi street to Tyler street; that purporting to act under and pursuant to said resolution the board of public works of said city of La Crosse notified the petitioner on Aug. 30, 1909, to remove its poles on Third street from Mississippi street to Johnson street, and on Mormon Coulee road from Johnson street to Tyler street; that the term Mormon Coulee road is a designation popularly given to South Front street in said city of La Crosse; that the distance on said South Front street, along the boulevard thereof, from Mississippi street to Tyler street is about 2,500 feet, and that the petitioner has poles along said street for a distance of about 650 feet, extending from Tyler street to Johnson street, and also has poles on Third street, from Johnson street to Mississippi street, a distance of about 800 feet; that said South Front street, also known as Mormon Coulee road, between Tyler and Johnson streets, is not a main business or residence street and is partially unoccupied and partially used for a few inexpensive residences; that said street and the grass plots in front of the residences thereon are not carefully kept, and that said street is close to the main track of the Chicago, Burlington & Quincy Railroad, over which trains pass frequently and along which railway right of way there extends a line of telegraph poles carrying many wires; that said portion of Third street between Johnson street and Mississippi street is not a main business or residence street and is also used chiefly for small residences of an inexpensive character, and that said street and the grass plots in front of the residences thereon are not carefully kept; that, as above set forth, the petitioners' poles on said portion of South Front street and on said Third street were erected approximately more than ten years ago lawfully and by due authority of law; that no substantial change has occurred in the character or nature of said streets since the erection of said poles, and that said poles were and now are proper and adapted to the nature of the street; that petitioner's toll lines cannot be placed in cables, either underground or aerial, but must be conducted on open wires; that any building or reconstruction of petitioner's lines away from said Third street and said South Front street would be attended with great practical difficulties, because service must be furnished to subscribers close to and on said South Front street; that there are no alleys or other streets parallel to South Front street through which poles and wires could be drawn, and that it would be necessary to acquire private rights of way by purchase or condemnation, or to make long detours for toll lines and use underground cables for the exchange service, and that the expense of removal of such poles and wires and reconstruction to meet the requirements of said resolution and order would be the sum of about $7,000; that when such reconstruction was completed, petitioner would have no assurance that immediate reconstruction on some different plan would not be required.

That the conduct of petitioner's La Crosse exchange is at present unremunerative and that the loss in operating said exchange would be increased by loss of return on the additional capital which would be required to be invested in order to comply with this ordinance; that petitioner's poles on said portion of South Front street are fifty to sixty feet high, and that the buildings on said street are low and that the cables and wires are high above nearly all the buildings on said street, and in no wise interfere with the use of any of said buildings or the right of way thereto; and that such poles, cables and wires are not in any way an obstruction, inconvenience or injury to the public, and do not cause or contribute to any injury to the public safety, convenience, comfort, or utility in the management of city affairs, and are not unsightly; that the city of La Crosse has many other districts of the city which are more populous and contain handsomer and better buildings, and that on all such streets, including the main business streets of said city of La Crosse, there are numerous wires which carry high voltage current and are much more likely to constitute an element of danger or obstruction than petitioner's poles, wires or cables on said South Front street; that in order to comply with the provisions of said resolution, either by the removing of its said poles and wires into streets other than said South Front street in said city, or to construct on said South Front street conduits for the purpose of carrying its said wires, it would be necessary for petitioner to institute condemnation proceedings under the statutes; and that no poles or wires could be placed in said street and no work for the construction of such underground conduits could lawfully be begun until after the completion of such condemnation proceedings; that the time allowed by said resolution and notice of the board of public works, to-wit: thirty days, is entirely insufficient to admit of such condemnation proceedings and the installing of said poles and wires or conduits; and that to comply with said ordinance will necessitate a total disruption of petitioner's service maintained by poles and wires now located in and along said South Front street; that said resolution and said notice are grossly unreasonable, and are arbitrary, and are unreasonably, unjustly and illegally discriminatory, and are wholly invalid, null and void.

The petitioner further alleges that on or about July 8, 1909, said mayor and common council of the city of La Crosse adopted and passed a resolution in and by which the board of public works of said city of La Crosse were authorized and directed to notify all companies having telegraph, telephone and light poles in the brick paved district to place the wires underground and remove the poles within sixty days from the date thereof; that under and pursuant to said resolution and on July 11, 1910, the board of public works of said city of La Crosse notified the petitioner to comply with the above resolution, meaning thereby that the petitioner should remove all its poles in said brick paved district, and further notified said petitioner that failure to comply with said resolution by said petitioner would necessitate the enforcement of said resolution by said board of public works; that the brick paved streets in the city of La Crosse include South Front street between a point close to Green Bay street and West street, and Mill street between the tracks of the Chicago, Milwaukee & St. Paul Railway Company and St. Cloud street, and Fifth street between State and Vine streets, and that the petitioner's poles extend along said South Front street between Green Bay street and West street for a distance of approximately 2,100 feet, and along said Mill street between said tracks of the Chicago, Milwaukee & St. Paul Railway Company and St. Cloud street for a distance of approximately 1,300 feet, and along said Fifth street between said State street and Vine street for a distance of approximately 400 feet, making an aggregate of approximately 3,800 feet; that substantially all of the poles on said portions of South Front street, Mill street and Fifth street in said so-called brick paved district were lawfully erected at times in and prior to the year

1900, and have been maintained and operated there ever since, and that said poles bear aerial cables and wires for exchange service, and that said poles on said South Front street and Mill street also bear open copper wires for toll service, and that such wires for toll service are used for communication between the city of La Crosse and other cities and places, the wires for the conduct of which must necessarily pass through the city of La Crosse, including communication between points outside of the state of Wisconsin.

That said South Front street between Green Bay and West streets is not a main business or residence street, and is partially occupied and principally used for a large brewery and a few small retail stores, and that said street is close to the main track of the Chicago, Burlington & Quincy Railroad Company over which trains pass frequently and along which railway right of way there extends a line of telegraph poles carrying many wires; that said portion of Mill street between the Chicago, Milwaukee & St. Paul Railway and St. Cloud street is not a main business or residence street and is also used chiefly for small retail stores; that said portion of Fifth street between State and Vine streets is not a main business or residence street and is used chiefly for inexpensive residences; that petitioner's poles on said portion of South Front street and on said Mill street and Fifth street were erected approximately more than ten years ago, lawfully and by due authority of law; that no substantial change has occurred in the character or nature of said streets, except that the same have been paved since the erection of said poles, and that said poles then were and now are proper and adapted to the nature of the streets; that petitioner's toll lines cannot be placed in cables, either underground or aerial, but must be conducted on open wires; that any building or reconstruction of petitioner's lines away from said South Front street, Mill street and Fifth street would be attended with great practical difficulty, because service must be furnished to subscribers close to and on said streets, and that it would be necessary to acquire private rights of way by purchase or condemnation, or to make long detours for toll lines and use underground cables for the exchange service, and that the expense of the removal of such poles and wires and reconstruction to meet the requirements of said resolution and order would be the sum of about $10,000; that when such reconstruction was completed, petitioner would have no assurance that immediate reconstruction on some different plan would not be required.

That the conduct of petitioner's La Crosse exchange is at present unremunerative and the loss in operating said exchange would be increased by the loss in return on the additional capital which would be required to be invested in order to comply with this ordinance; that petitioner's poles on said portions of South Front street and Mill street are fifty to sixty feet high, and on said Fifth street are thirty feet high, and that the buildings on said streets are low and that the cables and wires are high above nearly all the buildings on said streets and in no wise interfere with the use of any of said buildings or the right of way thereto; that such poles, cables and wires are not in any way an obstruction, inconvenience or injury to the public, and do not cause or contribute to any injury to the public safety, convenience, comfort or utility in the management of the city affairs, and are not unsightly; that the city of La Crosse has many other districts of the city much more populous and containing handsomer and better buildings and that on all such streets, including the main business streets of the city of La Crosse, there are numerous wires which carry high voltage current and are much more likely to constitute an element of danger or obstruction than petitioner's poles, wires and cables on said South Front street, Mill street or Fifth street; that in order to comply with the provisions of said resolution, either by the removing of its said poles and wires into streets other than said South Front street, Mill street and Fifth street in said city or to construct under said South Front street, Mill street and Fifth street conduits for the purpose of carrying its said wires, it would be necessary for petitioner to institute condemnation proceedings under the statutes; that no poles or wires could be placed in said streets and no work for the construction of such underground conduits could lawfully be begun until after the completion of such condemnation proceedings; that the time allowed by said resolution and notice of the board of public works, to-wit: sixty days, is entirely insufficient to permit of such condemnation proceedings and the installing of said poles and wires or conduits; and that to comply with said ordinance will necessitate a total disruption of petitioner's service maintained by poles and wires now located in and along said

South Front street, Mill street and Fifth street; that said resolution and said notice are grossly unreasonable and arbitrary, and are unreasonably, unjustly and illegally discriminatory, and are wholly invalid, null and void. Wherefore, petitioner prays that the Commission shall find and determine said resolutions and orders, and each and every one of them, to be unreasonable and void.

The respondent city, answering the petition, admits that the petitioner is a corporation as alleged and is engaged in furnishing telephone service, both through exchange and toll lines; and that on or about Aug. 27, 1909, the mayor and common council of the city of La Crosse adopted the first resolution mentioned and described in the petition.

Respondent, further answering the petition, alleges that the street referred to in the resolution mentioned is a street which winds in conformity with the Mississippi river and on which there is a large amount of travel, and is a prominent driveway for the citizens of La Crosse; that the park commission of said city has made efforts to beautify said street, which is a very beautiful driveway overlooking the Mississippi river; that a cement curb and gutter has been put in upon both sides of said street and a permanent pavement with concrete foundation is contemplated by said city of La Crosse for said street; that the petitioner can very readily remove its poles from said street and place them in the alleys and streets to the east thereof, with very little inconvenience and expense; that the petitioner has no local service upon said street; that said street is not a business street, with the exception of a short piece thereof; that the petitioner had ample notice for the removal of said poles, both by the board of public works, by written notices, and by resolutions of the common council; that in regard to the matter of the toll service and underground wires the petitioner already had its wires go underground for a distance of several blocks on Jackson street and run into the central office of said company; that the toll service of said company upon the street referred to is very small, and the wires said company has on said street for the most part are used for subscribers within a mile or two of the city of La Crosse. Respondent further alleges, respecting the second ordinance set forth in the petition, that such ordinance of the city of La Crosse requires all electric light and telephone wires in streets and alleys paved with permanent street improvements, such as brick pavements, to be placed in underground conduits; that said ordinance was passed April 14, 1904, and has been in operation during all these years; that said petitioner has complied with the provisions of said ordinance to a certain extent, but upon the streets mentioned in the petition the said company has refused and failed to comply with said ordinance, and for that reason the order was issued by the board of public works to which reference is made in the petition; that the city of La Crosse has an independent telephone company doing business in competition with said petitioner, and that said independent telephone company has complied with the provisions of said ordinance as has also the La Crosse Gas and Electric Company; that the streets described in the petition are all paved with brick and are streets on which there is a large amount of travel; that the petitioner could have complied with the provisions of said ordinance without much inconvenience and expense in the same manner that the other companies having poles and wires in said streets complied with the same; that outside of the ordinance therein referred to, the board of public works have repeatedly notified the petitioner to remove its poles and wires; that in regard to the poles and wires on the Mormon Coulee road, for instance, the said petitioner was notified in February that said improvement was to be made and received different notifications from that time on until the pavement was laid some time in August, and had all of that time to comply with the provisions of said ordinance. Wherefore, the respondent prays that the petition be dismissed and for such other order as may be just in the premises.

The matter came on for hearing on Jan. 30, 1911. The petitioner was represented by *Edwin S. Mack* of *Miller, Mack & Fairchild,* of Milwaukee, Wis., and the respondent was represented by *John F. Doherty,* its city attorney.

It appears that the distance on South Front street along the boulevard from Mississippi street to Tyler street in the city of La Crosse is about 2,500 feet; and that the petitioner has poles along said street for a distance of about 1,650 feet, extending from Tyler street to Johnson street, and also has poles along Third street, a distance of 800 feet, extending from Johnson street to Mississippi street. According to the petitioner it would cost about $6,000 to remove the poles from South Front street to an adjoining street or alley, and to lay the wires in underground conduits in other portions of the paved district of the city would require an expenditure of $5,500. There would be some inconvenience occasioned by the change in the telephone system, but such change is not at all impractical. As the city only urges in this proceeding the removal of the poles from South Front street, it becomes unnecessary to consider the reasonableness of the ordinance in its application to other streets.

The city has, up to the present time, expended considerable money in grading and paving South Front street. A piece of land adjoining the street is to be converted into a small park. The Chicago, Burlington & Quincy Railroad Company gave a portion of this land to the city for such purpose and has, without expense to the city, furnished and hauled a number of trainloads of earth for filling the low places in the park land, assisted the city in draining the same, and expended money in otherwise preparing the land for the purpose for which it is intended. The street is narrow, and numerous telephone and electric poles are located upon both sides thereof, which are of uneven length, old in the main, and very unsightly. Property owners along the street have been and are improving their property and seriously object to the continuance of the poles upon the street. The poles could be moved without much difficulty to adjoining streets and alleys on the east. A view of the street convinces us that the demand of the property owners, that the poles be removed from the street, is not unreasonable under the circumstances. As this street overlooks the Mississippi river, it is one of the most beautiful drives in and about the city of La Crosse. The beauty of the street is greatly marred by the unsightly poles that line both sides thereof. It also appears probable that in case of fire in any one of several buildings on this street, and particularly in the plant of the Gund Brewing Company, difficulty and danger might be incurred by the fire department in reaching the fire, because of the numerous wires strung upon the poles in close proximity to the buildings.

There is no contention that any contractual relation exists between the city and the telephone company by which the city, in the exercise of the police power, could be prevented from compelling the removal of the poles to adjoining streets or alleys, or dispensing with their use entirely and placing the wires in conduits beneath the surface of the street, provided the exigencies of the situation justified such action on the part of the city.

It appears that petitioner's poles were located in the street without the consent of the city, and have been maintained there by mere acquiescence on the part of the city. Nevertheless, the petitioner contends that it now has a right to keep the poles in their present location and challenges the right of the city to remove them or compel petitioner to remove them or to discontinue their use as required by the first resolution above mentioned. Before considering the resolutions in controversy, it may be well, first, to examine into the powers of the mayor and common council to dictate and regulate the location of telephone poles within the streets and other public thoroughfares of the municipality.

The right given to telephone companies by sec. 1778 of the Statutes, to construct and maintain their lines upon, in, along, across, or beneath the surface of any public road or highway, is subject to all reasonable regulations by the municipalities along the streets and public thoroughfares of which such lines are constructed and maintained. "All legislative grants to private corporations to occupy streets with electrical appliances are impliedly, if not expressly, subject to the police power of the municipality, both to dictate and to change the location of such plants." *Monongahela v. Monongahela E. L. Co.* 4 Am El. Cas. 53. The rule thus ennunciated has received the sanction of our supreme court in *Marshfield v. Wis. Tel. Co.* 102 Wis. 604, 610, 611, where it is said

> "That, in the exercise of this power, the city authorities may go so far as to prohibit the encumbering by telephone poles of certain of its streets, in the exercise of a reasonable discretion, is equally clear. Such right necessarily follows from the grant of the power to regulate. It is also implied from the fact that the dominant purpose of a street is for public passage, and any appropriation of it by a legislative sanction to other objects must be deemed to be in subordination to this use, unless a contrary intent is clearly expressed."

The authorities are unanimous on the proposition that the municipality may, in the first instance, control the location of poles and electric wires in the streets, but after having once granted the right to the use of the streets for such purpose and the company having complied with and constructed its line according to the terms and conditions of the grant, the municipality cannot, in the exercise of the police power, according to some authorities, change the location and thus impose a burden upon the company, except it be clearly shown that public safety or convenience requires such change.

In *Hannibal v. Mo. & K. Tel. Co.* 31 Mo. App. 23, it was held that a city may not enforce an ordinance peremptorily directing a telephone company to re-locate its poles in an impracticable manner, after the poles have been located and allowed, when it is neither averred nor shown that the existing location incommodes the public, nor that there was any good reason for the removal of the poles.

In *Plattsmouth v. Neb. Tel. Co.* 80 Neb. 460, it appears that the city passed an ordinance in 1899 requiring the defendant to place its wires underground in Main street, and in 1904 passed another ordinance requiring the defendant to move its poles and wires to the alleys adjoining. The defendant failed to comply with the requirements of either ordinance and the city brought an action in equity for a mandatory injunction. In passing upon the question germane to the matter herein under consideration, the court said (pp. 466—467):

> "The only question remaining is whether the public necessity or convenience requires that its wires in Main street should be placed in underground conduits or removed to the alleys north and south of said street, between First and Eighth streets. That the rights of the defendant in the streets of the city must yield to public necessity or convenience is beyond question or dispute; but, having acquired a right in the streets, and having made expenditures on the strength of the grant extended by the city, the authorities are quite uniform that this right cannot be taken away in an arbitrary manner and without reasonable cause. * * * That the city council may make reasonable regulations relating to the maintenance and repair of the defendant's plant is not open to argument; but such regulation is not to be exercised at mere whim or caprice. It must be proportionate to, and commensurate with, the public necessity for the protection and promotion of the public health, safety, necessity or convenience. The application of the police power cannot be extended by the authority which is entrusted with such application to an arbitrary misuse of private rights. That the city may order the removal of poles which endanger the citizens because of a rotten condition, and protect its inhabitants against any conduct of the business which endangers the public health or safety, is not a question open to dispute; but nothing of the kind appears in the record before us. As before stated, Main street is 100 feet in width. There is no evidence of a congested condition of the street or of any necessity from other causes for removing the defendant's poles.

> "So far as the record discloses, the action of the city council is arbitrary in its nature and wholly unsupported by any reasonable cause."

In *Northwestern Tel. Exch. Co. v. City of Minneapolis,* 81 Minn. 140, 147—149, the city of Minneapolis in 1886 by an ordinance required the telephone company to remove its poles throughout a certain district defined therein, embracing the business portions thereof and including a total area of 81-100 of a square mile, and to place its wires throughout this district in cables laid in conduits beneath the surface of the streets. The company complied with this requirement. In 1899 the city passed another ordinance requiring the company to remove poles and place its wires in conduits over 186 miles of street in which the plaintiff maintained 70 miles of pole line system, carrying over 3,000 miles of wire, costing $125,000, and supplying service to more than 2,000 subscribers. The company refused to comply with the order and brought an action against the city to restrain it from enforcing the same. The court says:

> "Recently the subject of municipal control over the erection and maintenance of poles and electric wires in the streets of cities has received particular attention from the courts, and it has been held that an electric company, which has been granted, by the legal authorities, the right to use the streets, and has constructed its line in compliance with and in reliance upon the terms and conditions of such grant, cannot be made the subject of new conditions, aside from what may necessarily be required of it by the city in the proper exercise of the police power and the control and regulation of the streets. * * * The requirements imposed by the latter ordinance upon the company to build such conduits through ungraded streets in suburban parts of the city and in the open country, are clearly, upon its face, unreasonable, and the claim to exercise such right on the part of the common council of the city at their 'will and mere motion' cannot be sustained in the reasonable exercise of the police power, or upon any theory that is consistent with the acquired and vested rights which the plaintiff enjoys under the constitution and the laws. * * * A city has the right to enact reasonable ordinances, and to enforce them; but it is the conservator, not the autocrat, of the police power. It may originate the exercise of its useful authority, and apply it by specific and valid regulations; but that exercise is not despotic, nor absolute, but is open to review, and an ordinance that upon its face is unreasonable and arbitrary is subject to judicial examination. When it is not bounded by a fair and wise administration of municipal authority, but is unreasonable and arbitrary, it will

be declared void, and the municipality restrained from its enforcement."

In Keasbey on Electric Wires (2nd ed.), sec. 66, the author says:

> "It would seem to follow from the decisions already referred to with regard to overhead wires, that municipal corporations have not the power to order existing lines lawfully put up to be taken down and put underground. It is well settled that wires having been once properly put up under legislative authority, and with municipal consent, cannot be disturbed by the municipality without authority from the legislature."

The proposition thus stated in the authority last cited has been criticised and cannot be accepted as sound or as sustained by the authorities. Elliott, referring to the same in his treatise on Roads and Streets (2nd ed.) sec. 819, says:

> "It is said by a recent text writer that where wires have once been properly put up overhead with municipal consent they cannot be disturbed by the municipality. But we think that, according to the better reason and the intimations in the authorities already referred to in this and the last preceding section, a municipality having the usual police powers and authority over its streets, may, in the absence of anything to the contrary, require existing companies to place wires underground whenever the public welfare and safety reasonably require that they should be so placed."

The rule that may be deduced from the best considered authorities on the subject is, that a municipality, in the exercise of its police power, may, in a proper case when public safety, necessity or convenience requires the removal of telephone or electric poles from any thoroughfare and the wires to be placed in conduits or the poles to be moved to another location, by ordinance or resolution duly passed, require such change to be made.

It is not the ascertainment of the rule, but the application of the same to the particular state of facts under consideration in any particular case that is often difficult in determining whether municipal action upon the subject is reasonable or unreasonable, as the line of demarcation between what is required and what is not required to subserve the convenience or necessity of the public in the premises is not always clear or indisputable: and, hence, it would seem that in case of any doubt the same should be resolved in favor of the legality of the regulation imposed by the municipality upon the public utility.

In the present case we do not deem that the cost of moving the poles and setting them in the adjoining alley would, in itself, be an adequate reason for declaring a proper ordinance or resolution of the common council requiring such alteration in the system of the telephone company void because imposing an unreasonable regulation. Such cost would be no more than commensurate with the public convenience resulting from the change. Nor is the difficulty in making such change, as contended by the petitioner, of sufficient consequence to stay the act of the city designed to accomplish a laudable civic enterprise.

Under the facts disclosed in the instant case, it would seem that the authority of the city to cause the poles to be removed from a street upon which it has expended considerable money for the purpose of converting it into a boulevard and driveway, for which it is suitably adapted because of its location upon the bank of the river, ought to be conceded; otherwise the purpose of cities to thus devote public thoroughfares to certain uses for which they are peculiarly fitted by nature would often be thwarted.

Speaking generally of the power of cities to control the location of telegraph poles in the streets, DRUMMOND, J., in *Mutual Union Teleg. Co. v. Chicago,* 16 Fed. 309, 315, said:

> "I can have no doubt that it is entirely competent for the city authorities, unless they are bound by some absolute contract permitting the poles and wires to stand as they are, to have them removed, and put an end to such unsightly obstructions as these poles and wires are now in our streets. There must be a power, I think, somewhere, to cause them to be removed, and to regulate and control the manner in which telegraph lines shall enter and pass through the city."

Front street is now paved, and to remove the poles and place the wires in underground conduits would necessitate the tearing up of a large portion of the pavement, the cost of which could not be justified from the exigency of the case under existing circumstances, and besides the authorities of the city would be unwilling to have the pavement disturbed for such purpose as the lines can be conveniently relocated in adjoining streets and alleys without interfering with the pavement. Nor does the resolution applicable to the situation entail such consequences. The first resolution passed by the common council on July 8, 1909, is as follows;

"Resolved by the Mayor and Common Council of the city of La Crosse that the Board of Public Works be and they are hereby authorized and directed to notify all companies having telegraph and light poles in the brick paved district, to place the wires underground and remove the poles within sixty (60) days from date."

The second resolution adopted by the common council Aug. 27, 1909 is as follows:

"Resolved by the Mayor and Common Council of the city of La Crosse that the Board of Public Works be and they are hereby authorized to order the removal of all telephone and other poles on South Front street along the boulevard thereof from Mississippi street to Tyler street."

It thus appears that the second resolution modified the first resolution insofar as the former required the placing of wires in underground conduits on South Front street along the boulevard, between Mississippi and Tyler streets. According to the first resolution aerial wires were prohibited entirely in the paved district, which includes the portion of the street in question, but the second resolution merely requires the removal of the poles from such portion of the street therein designated, leaving it to the discretion of the company whether to locate them, upon such removal, in adjoining streets or alleys, or upon private right of way, or to discontinue their use entirely and to place the wires underground. Hence, the only question left for our determination is whether the regulation provided in the resolution of Aug. 27, 1909, is a reasonable exercise of the police power by the municipal authorities. In addition to the objections hereinbefore considered, it is claimed that the notice of the board of public works did not give the company a reasonable time within which to remove the poles. The resolution is silent as to the time within which the change is to be made and the company has therefore a reasonable time within which to comply with the regulation. The board of public works is given no authority by the resolution to prescribe a lesser period than is reasonably required for the undertaking. For the reasons stated we find the resolution of the common council, duly passed on Aug. 27, 1909, a reasonable regulation and valid.

Now, THEREFORE, IT IS ORDERED, That the petition herein be and the same is hereby dismissed.

TOWN OF WAUWATOSA
VS.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 20, 1911. Decided July 26, 1911.

Petition for an order to provide adequate means of protection to travel, either by gates, electric signals, or other suitable device at Potter ave. crossing in the town of Wauwatosa.

Ordered: **That respondent install an automatic audible alarm, with an illuminated sign in addition.**

The petitioner is a municipal corporation of Milwaukee county. The petition is signed by the town board of supervisors, and states that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that it is very thickly populated and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicles; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses the highway in the town of Wauwatosa known as Potter avenue; that said Potter avenue is sixty-six feet wide and is used largely at a point where said Chicago & North Western Railway crosses same, by farmers in the carrying of produce to and from the city of Milwaukee as a market; that it is the intention of the railway company to cross the said highway at grade, and that such grade crossing will be unsafe and dangerous to travel over such highway, and that some safeguard ought to be provided by said Chicago & North Western Railway Company for the protection of the public, either by gates, signals, or some other method. Wherefore, petitioner prays that the said Chicago & North Western Railway Company be ordered to provide adequate means of protection to travel, either by gates, electric signals, or other suitable device.

The respondent, in answering the complaint of petitioner, states that it expects to provide proper means of protection by way of gates, electric signals or other device, and that it is the present intention to provide gates.

The hearing was held on Feb. 20, 1911, at the town hall in the city of Wauwatosa. The petitioner was represented by *G. J. Davelaar.* The respondent had no representative present.

The testimony taken at the hearing shows that Potter avenue lies in secs. 29 and 30 in the town of Wauwatosa and is a highway running northeast and southwest, and that it connects the Milwaukee-Watertown plank road on the north with the Blue Mound road on the south, both of which are east and west highways with considerable vehicle traffic. The witnesses for the petitioner stated that the railroad crossing in question lies in the northeast quarter of sec. 30 and that the highway is used largely by farm teams; that a school house is within one-half block of the crossing, and that some suitable device should be provided to protect human life. Witnesses expressed the belief that an electric signal would be sufficient protection, although a gate would be preferred.

An examination of the ground has been made by the safety service expert of the Commission, who states that the conditions at this point are not such as to justify a flagman, and that it would appear that an automatic audible alarm is all that the conditions require at the present time. He recommends that in addition to the automatic audible alarm an illuminated sign be installed.

Taking all the above facts and conditions into consideration, it does not seem that it will be necessary to provide gates at the crossing in question, but that the protection recommended by the engineering staff will be adequate for the present.

It is Therefore Ordered, That the respondent, the Chicago & North Western Railway Company, install, operate and maintain at the intersection of its Milwaukee-Sparta extension with Potter avenue in the town of Wauwatosa an automatic audible alarm, with an illuminated sign in addition to the usual audible alarm.

Sixty days will be deemed a reasonable time within which to comply with this order.

TOWN OF WAUWATOSA
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 20, 1911. Decided July 28, 1911.

Petition for adequate protection to travel at Burleigh street crossing in the town of Wauwatosa.

Ordered: **That the respondent, within sixty days, install an automatic audible alarm, with an illuminated sign in addition.**

The petitioner is a municipal corporation of Milwaukee county. The petition is signed by the town board of supervisors, and states that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that it is very thickly populated, and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicles; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway in the town of Wauwatosa, known as Burleigh street; that said Burleigh street is a highway sixty feet in width, and one of the thoroughfares or arteries of travel running east and west in said town of Wauwatosa, and used largely at this point by farmers in carrying produce to and from the city of Milwaukee as a market; that said Chicago & North Western Railway Company is building said extension at the point where the same crosses at Burleigh street, as a grade crossing, intending to operate at this point a double-track system; that said grade crossing will be unsafe and dangerous to travelers over such highway, and that some safeguard ought to be provided by said railway company in the protection of the public, either by gates or signals, or some other method. Wherefore, petitioner prays that the said Chicago & North Western Railway Company be ordered to provide adequate means of protection to travel, either by gates, electric signals, or other suitable device.

The respondent, in answering the complaint of the petitioner, alleges that it expects to provide proper means of protection by way of gates, electric signals, or other device at said crossing.

The hearing was held on Feb. 20, 1911, in the town hall in the city of Wauwatosa. The petitioner was represented by *G. J. Davelaar.* No one appeared for the respondent.

The testimony shows that the crossing in question is located in the n. e. ¼ of sec. 18 and s. e. ¼ of sec. 7, town of Wauwatosa, and that the highway is a continuation of Burleigh street, running through the city of Milwaukee, making it one of the most heavily traveled highways in the town, largely by farmers, and that the highway is heavily traversed by funerals, there being two large cemeteries in Wauwatosa; that the crossing is deemed unsafe and dangerous, and that public safety will require gates or signals.

An examination of the ground has been made by the safety service expert of the Commission. He reports that the crossing is somewhat obstructed by trees on each side of the highway, and that some protection should be provided for this crossing. He believes that an automatic alarm will be sufficient, as the conditions at this time are not such as to necessitate the employment of a flagman. He recommends that an automatic audible alarm be installed at this point, with an illuminated sign in addition to the usual audible alarm.

Taking all the above facts and conditions into consideration, it does not seem that it will be necessary to provide gates at the crossing in question, and that the protection recommended by the engineering staff will be adequate for the present.

IT IS THEREFORE ORDERED, That the respondent Chicago & North Western Railway Company install, operate and maintain at the intersection of its Milwaukee-Sparta extension with Burleigh street, in the town of Wauwatosa, an automatic audible alarm, with an illuminated sign in addition to the usual audible alarm.

Sixty days will be deemed a reasonable time within which to comply with this order.

TOWN OF WAUWATOSA
VS.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 18, 1911. Decided July 28, 1911.

Petition for adequate crossing at North Town Line road crossing in the town of Wauwatosa. The testimony shows that the respondent intends to construct a regular yard system at this point and to construct eight to ten switching tracks over this highway in addition to the two main tracks; that the location of the yards at this point is causing a village to be built up which will greatly increase the amount of traffic on this highway; that a grade crossing would be dangerous to travel.

***Ordered:* That within six months the respondent construct an overhead crossing at the North Town Line road crossing.**

The petitioner is a municipal corporation of Milwaukee county. The petition is signed by the board of supervisors of said town, and sets forth that said town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that it is very thickly populated and contains many large quarries and manufacturing industries; that its highways are subjected to a very heavy traffic, both by team and motor vehicle; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway in said town of Wauwatosa known as the North Town Line road; that said Town Line road is one of the thoroughfares or arteries of travel running east and west in said town of Wauwatosa, and that petitioner is informed that it is the purpose of said railway company to build railroad yards at the point at which it crosses said Town Line road, containing many railroad tracks, and that if said railroad crossing is made at grade, it will not only be extremely dangerous to the public safety, but also will obstruct and blockade the traffic on said highway; that said railway company, in making excavation at this point for its tracks, has wholly failed to provide any way of crossing same while under construction, wholly blockading traffic on said Town Line highway, and that a water tank is located at a point where said Town Line highway formerly and before excavation existed. Wherefore, petitioner prays that an order be issued requiring the said Chicago & North Western Railway Company to construct a temporary highway at such point of intersection, and order such mode and manner of crossing as shall be determined upon by the Commission.

The respondent in its answer alleges that the travel on the line of railroad will be wholly freight traffic and will not be conducted at the high rates of speed which occur out on the line between stations and where passenger trains would pass at speed; that the highway in question, by comparison with other highways in other parts of the state and in and around Milwaukee, is not subject to a large volume of traffic, and that, if properly constructed, a grade crossing at the point in question would be sufficient to take care of the traffic at that point with reasonable safety.

The hearing in the matter was held at the town hall in the city of Wauwatosa on Feb. 18, 1911. *G. J. Davelaar* appeared for the petitioner, and *W. G. Wheeler* for the respondent.

The testimony shows that the North Town Line road is the most northerly east-and-west highway in the town of Wauwatosa. It has a width of sixty-six feet and traverses the entire township. There is considerable traffic on the eastern portion, but less on the western end. It is used principally by farmers in taking produce to Milwaukee and returning with merchandise. The respondent's railway crosses the highway at grade in the northwestern part of sec. 6 of the town of Wauwatosa. Immediately adjoining the highway on the respondent's right of way is a water tank for the use of respondent's engines. Witnesses for the railway company testified that it is the intention to construct and maintain a regular yard system of trackage in the vicinity, to be known as Butler yards, which will be approximately two miles in length and varying in width to the maximum of about one-quarter of a mile. The proposed yard system is intersected at its narrowest point by the highway in question, which is crossed at present by five or six tracks. On each side of the highway the yard gradually curves outward until the extreme width is reached at approximately one thousand feet distant from the crossing. The assistant engineer of the railway company stated that he could not give the number of tracks comtemplated to be laid at the widest part of the yards, but thought possibly there would be eighteen or twenty tracks. The right-of-way agent testified to the purchase of virtually two hundred acres of land for yard purposes. Witnesses for the petitioner testified to the failure of the railway company to provide a temporary crossing at said highway during the course of construction, and stated that several complaints had been made to them as town officials of inability to discover the temporary roadway or detour provided by the railway company, especially at night time when there were no lights to guide travelers. This condition, which witnesses averred existed at the time the petition in the present case was filed, had since been remedied, and at the time of the hearing one of the town supervisors testified that a suitable crossing now exists.

Petitioner's witnesses expressed the opinion, as town officials, that a grade crossing at this highway, being in close proximity to a yard as contemplated, would be very dangerous to the public, and that an overhead crossing or a tunnel should be constructed. The plans of the company call for some eight or ten yard and switching tracks at this point in addition to the double track main line. As stated in the testimony, a water tank stands close to the crossing. A round house and turn table are in process of construction, just north of the highway. These three structures must be regarded as additional elements of danger by reason of their frequent use by respondent's locomotives. The almost continuous passing of engines to and fro would also block the crossing a considerable portion of the time if it be allowed to remain at grade. The establishment of a freight yard of the extent contemplated by the railway company would necessarily result in a very heavy traffic by trains and switching engines at this point, and it would be a difficult matter to protect a crossing of this character by a flagman. While the travel on the highway at this particular spot is not very heavy at present, yet, the locating of the above yards in this vicinity is causing a new village to spring up. Several buildings are already under construction, and it would appear that within a comparatively short time travel on this highway will be considerably increased. On the east side of the company's right of way the ground is on a level with the tracks, but at the west of the right of way the natural ground line is about eight feet above the track level. This latter condition is particularly favorable for constructing an approach to an overhead crossing, and there is also plenty of room for the construction of an approach at the east side of the right of way. This mode of crossing would eliminate all danger to vehicular and pedestrian traffic, and we believe would be of great economic value to the railway company in the operation of its through trains and general switching.

IT IS THEREFORE ORDERED, That the respondent, the Chicago & North Western Railway Company, construct and maintain an overhead crossing at the intersection of its Milwaukee-Sparta extension with the North Town Line road in the town of Wauwatosa, the approach to the same not to exceed a 5 per cent grade. Plans of the structure are to be submitted to the Commission for approval.

Six months is deemed a reasonable time within which to comply with this order.

DULUTH-SUPERIOR MILLING COMPANY
vs.
NORTHERN PACIFIC RAILWAY COMPANY.

Decided July 28, 1911.

Petition alleging that switching charges of $3 per car, exacted between Aug. 25, 1909, and Dec. 27, 1910, were illegal, unusual and exorbitant, the Commission having, on Dec. 6, 1910, reduced such charges to $1.50 per car.

Held: **That the making of an informal complaint prior to the expiration of the six months limitation, gives the Commission jurisdiction, even though formal complaint was not filed until after the expiration of the statutory time limit; that the rates exacted were unusual and exorbitant, and refund is ordered.**

The petitioner is a corporation engaged in business in the state of Wisconsin. It alleges that on Feb. 25, 1910, it filed a petition against the respondent railway company, alleging that said company was charging an illegal, unusual and exorbitant switching rate in the city of Superior, and praying for relief; that thereafter a hearing was duly had before the Commission, and an order was entered Dec. 6, 1910, by the Commission, reducing the switching charges of which complaint was made, from $3.00 to $1.50 per car; that thereafter, and on Dec. 27, 1910, the respondent railway company complied with the order of the Commission and reduced its switching charges from $3.00 to $1.50 per car; that on and between Aug. 25, 1909, and Dec. 27, 1910, it paid the switching rate to the respondent railway company of $3.00 per car on 490 cars of grain switched by said railway company to respondent's mills in Superior, and that on each of said cars it paid the illegal, unusual and exorbitant rate of $1.50 per car in addition to the legal rate as determined by the Commission; that therefore the petitioner is entitled to a refund from such railway company of $735, together with interest from Dec. 6, 1910. Wherefore, petitioner prays that an order be made and entered, directing and requiring the said respondent railway company to refund and pay over to the petitioner the said sum of $735, together with interest as aforesaid.

The respondent railway company, answering the petition herein, admits that on Feb. 25, 1910, the petitioner filed a petition against respondent, alleging that the switching charge of respondent of $3.00 for switching grain from the connection between the tracks of the respondent and the Minneapolis, St. Paul & Sault Ste. Marie Railway Company at Superior, to the mills of the petitioner, located upon the lines of the respondent, were excessive and unreasonable; that thereafter the Commission entered an order Dec. 6, 1910, directing the respondent to reduce its switching charges from its connection with the Minneapolis, St. Paul & Sault Ste. Marie Railway Company to the petitioner, from $3.00 to $1.50 per car; that it has since said order issued a new tariff, and has done such switching for $1.50 per car.

Further answering the petition, the respondent denies that between Aug. 25, 1910, and Dec. 27, 1910, the petitioner has paid to the respondent a switching charge of $3.00 per car for switching 490 cars of grain, or any other sum whatever.

The respondent admits that during said time it has at the request of the Minneapolis, St. Paul & Sault Ste. Marie Railway company, switched 490 cars of grain from the connection between the Minneapolis, St. Paul & Sault Ste. Marie Railway Company and the line of respondent at Superior, to the mills of petitioner in Superior, and that the Minneapolis, St. Paul & Sault Ste. Marie Railway Company has, at the end of each month, paid to the Northern Pacific Railway Company for such switching the sum of $3.00 per car.

The respondent further alleges that each and all of said cars switched as aforesaid contained grain which was brought to the city of Superior from points in other states in the United States outside of the state of Wisconsin; that prior to the doing of said switching in each instance there had been no delivery of the grain contained in said cars to the consignees named in the original contract of transportation from outside the state of Wisconsin, and that said switching was done by the respondent at the request of the Minneapolis, St. Paul & Sault Ste. Marie Railway Company in order to facilitate and enable the last named company to make delivery of said grain to the consignees named in the original contracts of interstate transportation, and was a part of the interstate transportation of said grain; that said charge of $3.00 per car for switching was made in accordance with the published tariffs of respondent for switching, which were then and there on file in the office of the interstate commerce commission at Washington, and this respondent could not lawfully do such switching at any other or different rate than $3.00 per car charged; that respondent is informed and verily believes that said rate is a fair and reasonable rate; that it is not within the jurisdiction of the Commission to either authorize or direct the respondent to refund any part of the switching charges collected as aforesaid, either to the petitioner or anyone else.

The petitioner was represented upon the hearing by *Crownhart & Foley,* its attorneys, and the respondent by *Emerson Hadley,* its attorney.

In *Duluth-Superior Milling Company et al. v N. P. R. Co.* 5 W. R. C. R. 598, it was held that the switching charge of $3.00 per car exacted by the respondent railway company for switching carloads of grain from the point of connection of the respondent's line and the line of the Minneapolis, St. Paul & Sault Ste. Marie Railway Company to the petitioner's mills was unusual, as it was double the amount charged by other railway companies for a similar service within the city of Superior. It was also found in such case that $1.50 per car would be reasonably compensatory for such switching service, and the charge was accordingly reduced to $1.50 per car. It is unnecessary to review the matter again, as the conclusion reached in the case cited is controlling in the instant case.

The question of the jurisdiction of the Commission was considered upon a re-hearing of the case cited, 6 W. R. C. R. 70. It was held that the service in question was an intra-state transaction and therefore within the jurisdiction of the Commission.

It is also objected that no complaint as to a number of the charges included in the petition herein was made to the Commission within six months after the shipments for which such charges were exacted, reached their destination. This does not seem tenable. Complaint was made as to such charges in the original proceding instituted for the purpose of reducing the charge in question, but according to the usual practice of the Commission the matter of refunds is determined in a separate proceeding based upon a formal petition therein, and hence no consideration was given to the claim for a refund in the proceeding to reduce the rate. Nevertheless, any informal complaint relative to any overcharge upon shipments of freight has always been regarded both by the interstate commerce commission and this Commission as sufficient to stop the running of the statute of limitations upon the claim. In such instances, although formal petition under the rules of practice of this Commission may not have been filed until after the limitation provided in the, statute has expired, the Commission has considered that the informal complaint to the Commission stopped the running of the statute, and therefore reparation has been awarded in such cases.

For the reasons stated, we find and determine that the charge of $3.00 per car exacted by the respondent railway company of the petitioner herein for the services rendered in switching 490 cars of grain from the connection of the respondent's railway line with that of the Minneapolis, St. Paul & Sault Ste. Marie Railway Company to the petitioner's mills in the city of Superior, is unusual and exorbitant, and that the reasonable charge to have exacted for such services would have been $1.50 per car.

Now, THEREFORE, IT IS ORDERED, That the Northern Pacific Railway Company be and the same is hereby authorized and directed to refund to the petitioner, the Duluth-Superior Milling Company, the sum of $735.

E. E. HART ET AL.
VS.
MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY.

Decided Aug. 1, 1911.

Petition alleging that the respondent, in the construction of a cut-off, had moved its line one and one-half miles from the unincorporated village of Albertville, Chippewa county.

Held: **That the respondent having taken the proper statutory proceedings under sec. 1832, and having obtained a certificate of public convenience and necessity, had full authority to construct the new line and abandon the line through Albertville; that the Commission is without jurisdiction to entertain the petition.**

The petitioners are residents of the village of Albertville, Wis. They allege that the respondent railway company has moved its line one and one-half miles north of said village and deprived the village of all train service; that the track that formerly passed through said village has been removed and that the village is without railway facilities as a result thereof. Wherefore, petitioners pray that the respondent be required to furnish the village of Albertville with railroad facilities.

The respondent railway company, answering the petition, admits that its track has been removed one and one-half miles north of Albertville, and alleges that by driving said one and one-half miles the petitioners can secure as good facilities as those formerly afforded to Albertville. It also shows that pursuant to law it has constructed a line of railway, or cut-off, from Colfax to Irvine; that the object of said cut-off is to afford a more direct and expeditious route between Minneapolis, St. Paul and western Wisconsin points, and Milwaukee, Chicago and southeastern Wisconsin points, and that said cut-off is now being used for that purpose, to the great advantage and convenience of the general public.

The petitioners were not represented upon the hearing. The respondent was represented by *A. H. Bright,* its general counsel.

Albertville is an unincorporated village. It is situated in Chippewa county, Wis. The respondent railway company has made a number of improvements on the lines of the Wisconsin Central Railway Company, the lessor of respondent. In straightening its line between Colfax and Howard it became necessary to locate the revised line one and one-half miles north of Albertville. In making such change the respondent or its lessor proceeded under sec. 1832 of the statutes, as amended, which reads as follows:

> "The board of directors of every railroad corporation may, by a vote of two-thirds of the whole number, at any time alter the route or any part of the route of their road or any extension or branch thereof, or any part of their road, or any extension or branch as constructed, if it shall appear to them that the line can be improved thereby; but no railroad shall be so diverted from any county, town, city or village which in its corporate capacity shall have extended aid to such road either while in the hands of the then present owner, or any former person or corporation; and no such alteration shall be made in any city or village after the road shall have been constructed therein unless the same have been sanctioned by a vote of two-thirds of the council of such city or of the trustees of such village. Before making any such alteration the board of directors shall designate the route thereof by resolution, to be entered in its records, filed and recorded in the office of the secretary of state, as provided in the preceding section. Thereupon it shall have the same right and privilege to build such road as altered as if it were an original line."

In addition to complying with the provisions of the foregoing section the company obtained a certificate of convenience and necessity authorizing it to change its line and construct the cut-off between Colfax and Irvine. As Albertville is an unincorporated village, it could not object to such a change. Under the circumstances, the Commission is without jurisdiction to entertain the petition.

Now, Therefore, it is Ordered, That the petition herein be and the same is hereby dismissed.

IN RE APPLICATION OF THE PEWAUKEE-SUSSEX TELEPHONE COMPANY FOR AUTHORITY TO INCREASE RATES.

Submitted July 28, 1911. Decided Aug. 1, 1911.

Application for authority to increase rates for business telephones, the rates in effect being the same for business as for residence telephones. An analysis of the operating expenses of the applicant indicate that they are not excessive. The revenues under existing rates are sufficient to pay expenses, depreciation and a reasonable return on the valuation as reported, and any very considerable increase in revenues would not be justifiable.

Held: **That business telephones should pay higher rates than residence telephones. The applicant is authorized to increase its rates for business telephones $3 per year and to put in effect a business rate for summer season only.**

The applicant, the Pewaukee-Sussex Telephone Company, which operates an exchange at Pewaukee, Wis., alleges in its application that its rates at present in effect are as follows:

Single lines in village, $18 per year, with discount of $3 per year for payment quarterly in advance.
Party line of six or less, $18 per year; same discount.
Party line of 10 or more, $15 per year; same discount.

The present rates are the same for business and residence telephones, and, for the reason that business telephones are used much oftener than residence telephones and are charged higher rates by almost all telephone companies, the applicant desires to put into effect the following rates for business telephones, leaving the residence rates unchanged:

Single line business telephones in village, $27; discount of $3 for payment in advance.
Party line business telephones, six parties or less, $21; discount of $3 for payment in advance.
Party line business telephones, ten parties or more, $18; discount of $3 for payment in advance.

The matter was heard at the office of the Commission, July 10 and July 28, 1911. The applicant was represented at both hearings by its manager, *Edwin Haskins; Alex. Caldwell* appeared in opposition to the application at the second hearing.

The testimony and other available sources of information disclose that the applicant operates an exchange at Pewaukee with about 240 subscribers, of whom 154 are rural; that it has been in operation since about 1904, and has extended its line by construction and purchase each year since that date, so that the value of its property has increased from less than $5,000 to nearly $10,000; that all of these extensions have been paid for out of earnings, and the original capitalization of $5,000 has not been increased; that no dividends have ever been paid, except a dividend of 3 per cent which was declared about two years ago.

The objectors to the application base their opposition upon the allegations that the applicant is now earning sufficient money to pay all expenses and a reasonable return upon the investment, and that, this being the case, the Commission will not authorize an increase in any of its rates. It is also objected that the applicant has not shown that business telephones cost more than residence telephones, and that, as a matter of fact, business telephones are often more of a convenience to the residence subscribers than they are to the business houses themselves.

The testimony and the reports of the applicant disclose the following valuation placed upon the property by the applicant at different times:

Report, June 30, 1909	$6,843.96
Report, June 30, 1910	8,205.59
Testimony, July, 1911	9,727.56

In comparison with other plants of similar size, the figures given above show a low valuation per subscriber. The 1911 valuation, upon the basis of 240 subscribers, amounts to $40.53 per subscriber, while the figure for the other two years, based upon the number of subscribers then reported, is about the same. This valuation is so moderate in comparison with that of other plants in the state, both as reported by such plants themselves and as determined in various cases by the engineering staff of the Commission, that it may safely be accepted as representing the amount upon which interest and depreciation should be earned. The fact that the stockholders have not invested the entire amount by the purchase of stock does not make it inequitable that the plant should earn upon its full present value. Although proper accounting principles demand that new construction should be a capital charge, and that earnings should be used to cover only operating expenses, depreciation and interests, nevertheless, if in the past the stockholders of the applicant company have foregone their dividends and neglected their depreciation reserve, and as a result have a plant representing the money that they might have used for interest and depreciation, it is not unjust, as between investors and subscribers, that they should earn in the future on the full value of the plant thus built up.

The income and operating expenses of the applicant for the years 1909, 1910 and 1911 are summarized in table I below. The data for 1909 and 1910 are taken from the applicant's reports, and those for 1911 are estimated from a statement submitted at the hearing and covering the first six months of 1911.

TABLE I.

EARNINGS AND EXPENSES OF THE PEWAUKEE-SUSSEX TELEPHONE COMPANY

	Year ending June 30, 1909.	*Year ending June 30, 1910.*	*Year 1911 on basis of 6 mo. Jan.-Jul. 1911.*
Revenues:			
Exchange telephone earnings	$2,372 46	$2,577 05	$3,071 60
Earnings from connecting lines	....	292 15	250 00
Total operating revenues	$2,372 46	$2,869 20	$3,321 60
Operating expenses:			
Central office	$648 45	$765 56	$840 00
Wire plant	162 09	344 95	632 00
Substation	92 29	135 51	129 56
Commercial	52 00	....	24 40
General	30 00	108 00	252 00
Undistributed	35 50	90 43	101 54
Total of above	$1.020 33	$1,444 45	$1,979 50
Taxes	44 55	65 63	77 38
Total operating expenses	$1,064 88	1,510 08	2,056 88
Net operating revenue	$1,307 58	$1,359 12	$1,264 72
Or, on reported investment	*19.11%*	*16.56%*	*13.00%*

The figures given for 1911 require some explanation. They are based upon a statement submitted at the hearing, which was as follows:

STATEMENT OF EXPENSE, JAN. 1, 1911 TO JULY 1, 1911.

Rent and operators	$400.00
Linemen	371.06
Manager	60.00
Directors	66.00
Instrument and contact rental	44.05
Batteries	40.73
Livery and board	57.80
Taxes	77.38
Postage and stationery	19.22
Examining committee	9.40
Sundry expense	48.55
Total	$1,194.19

The applicant pays $800 per year for operation of the central office, and of the cost of the batteries about half is chargeable to the central office. Thus, the central office expense is about $840. The item of livery and board, it was explained, embraces the expenses of certain employes of the Wisconsin Telephone Company, who spent some time in line work for the applicant. About half of this amount, according to the testimony, is chargeable to new construction, so that probably only about $30 of it belongs among the operating expenses. This expense is apparently in the nature of an extra item, and it is therefore not doubled to represent the full year. The expense of linemen as reported is considerably higher than for the two years preceding, and this fact was explained to be due to a noise on the line which was difficult to remedy and required the services of several experts. The linemen's expense was reported at $371.06 for the six months, but it is probable that an expense of $600 for the year is sufficient. In addition, $2 per year of the reported incidental expense is the cost of right of way, which is undoubtedly chargeable to the wire plant. This makes the annual wire plant expense $632. The substation expenses, as shown in table I, include the part of the battery expense not charged to the central office, and also the instrument rental paid by the applicant to the Wisconsin Telephone Company for a number of instruments which the applicant does not own. The sum as reported is doubled to represent the entire cost for a year. The account "Commercial expense" is charged with the $9.40 paid to a committee which audited the company's books, but as this is done only once a year, the item is not doubled. This account also includes $15 of the reported incidental expense, which, it seems, is paid to the bank annually for services in connection with the collection of the applicant's bills. The account "General expenses" includes the manager's allowance of $10 per month and a fee of $2 per meeting for each of the directors, whose meetings are held about once a month. The item reported by the applicant as incidental expenses, except so far as separated above, appears to consist of numerous small matters which are not itemized. For lack of any information as to their meaning, they are placed in the account "Undistributed expense," and doubled to represent the full year's expense, as is also the postage and stationery expense. The item of taxes is placed in table I exactly as reported by the company, since the taxes paid in the first six months cover the full year.

The objectors to the application complained of the amount allowed for directors' fees, as being out of proportion to the services rendered by the directors. The manner in which the general expenses, which include these directors' fees, as well as the other classes of expense included in table I, compare with the expenses of other plants in the state is shown in table II:

TABLE II.
COMPARATIVE EXPENSES OF TELEPHONE PLANTS.

Location.	Subscribers.	Expense per Subscriber.						
		Cent. office.	Wire plant.	Sub-sta.	Commercial.	General.	Undistributed.	Total.
Brooklyn	247	$4 17	$1 35	$1 75	$0 39	$0 63	$0 05	$8 34
Argyle	256	4 73	0 07	....	0 10	0 45	0 15	5 50
Oregon	285	4 29	3 93	0 80	....	0 42	....	9 44
Lone Rock	101	7 43	2 38	1 09	0 20	0 20	1 83	13 13
Hortonville (Wis. T. Co.)	253	2 69	1 03	2 82	1 01	2 76	0 30	10 61
Oostburg	160	3 50	0 93	0 69	....	3 57	0 12	8 81
Franksville	180	3 15	2 58	4 16	0 02	1 74	0 16	11 81
Omro (Wis. T. Co.)	309	1 69	0 99	2 01	1 32	0 55	0 33	6 89
Genoa Jct. (Wis. T. Co.)	179	3 37	3 58	3 30	1 52	1 17	0 38	13 32
Ripon	214	2 66	1 83	1 90	0 15	0 72	....	7 26
Eden	198	4 15	1 23	... ...	0 26	0 70	....	6 34
Palmyra (Eagle T. Co.)	240	4 36	2 56	0 82	1 44	2 07	....	11 25
Clear Lake	204	2 53	1 47	0 05	0 37	0 90	0 53	5 85
Leeds	235	1 74	1 45	....	0 77	0 34	0 91	5 21
Fall Creek	159	3 18	1 04	0 86	0 94	0 25	0 45	6 72
Eagle	194	3 13	3 15	0 83	1 22	2 01	... ...	10 34
Average	213	$3 55	$1 85	$1 32	$0 61	$1 16	$0 33	$8 82
Pewaukee-Sussex, 1911	240	$3 50	$2 63	$0 54	0 10	$1 05	$0 42	$8 24
Pewaukee-Sussex, 1910	202	3 79	1 71	0 67	0 00	0 53	0 51	7 15
Pewaukee-Sussex, 1909	182	3 56	0 89	0 51	0 29	0 16	0 20	5 61

The plants enumerated in the table are all of nearly the same size as the applicant, and have been selected with special reference to the completeness of their reports in dividing expenses among the various accounts. About half of them have been involved in cases before this Commission, and their accounts have heretofore been subjected to scrutiny, so that they are more likely to represent normal operating conditions than would be true of plants selected at random.

The above table shows that while the expenses of the applicant per subscriber have steadily grown, they are not now quite as high as the average of the plants named. It will be noted that the general expenses, which were thought by the objectioners to be excessive, are a little below the average for the plants. As a matter of fact, the amount paid by the applicant for the manager's services, $10 per month, is so low as to offset the director's fees. If the applicant wishes to pay its manager less and its directors more than the usual amount for their supervision of the plant, it would seem that the matter is one which should be left to the business judgment of the applicant, so long as the total supervision cost is not excessive.

It appears from table I that at the present rates the probable earnings of the applicant for the year 1911 are about $1,264.72, or almost exactly 13 per cent on the reported investment, without any allowance for depreciation or interest. In general it may be said that a telephone plant depreciates at such a rate as to require a depreciation charge of at least 7 per cent of the value of the plant each year. It is also generally true that a fair rate of return upon the investment in a plant such as the applicant's should be fixed at not less than 7 per cent. If the past year's surplus for interest and depreciation is 13 per cent, as above stated, the applicant is earning nearly as much as it is entitled to earn, but is not earning so much that an additional income of a hundred dollars or so would be excessive. It is true that in the years 1910 and 1909 it earned more than 14 per cent justly allowable for interest and depreciation, but a glance at the results of table II will show that this high earning was probably due rather to low operating expense than to high rates. The operating expenses assigned to the year 1911 in table I do not seem to be higher than the circumstances warrant, and it may very well be true, as stated by the representative of the applicant at the hearing, that certain of the expenses will in the future be very considerably increased.

The principle that business telephones should ordinarily pay a higher rate than residence telephones is adopted by nearly every telephone company and seems to be in accordance with sound theory. In the case of telephone companies, as in other utilities, the expense may be divided into two groups, those varying with the amount of business done, or the variable expenses, and those which remain practically the same whatever the amount of business done, or the fixed expenses. Such of the expenses of the plant as are fixed should be borne equally by all subscribers, since no one of them gets more benefit from the outlay than another. But such expenses as vary with the amount of business done by the plant are properly chargeable against subscribers in approximate proportion to the use of the plant made by each. To illustrate the difference between these two classes of expense in the case of a telephone plant, the expenses of maintenance of wire plant and of central office labor may be cited. The effect of weather upon telephone wires and poles is the same regardless of the number of messages which pass over the line, and the cost of maintaining such wires and poles has little relation to the amount of business done by the company. On the other hand, the time of the central office operators is wholly chargeable to the transmission of telephone messages, and a subscriber who takes ten times as much of the central operator's time as another subscriber is costing the telephone company practically ten times as much in central office operating labor.

In the instant case, it was testified by the manager of the applicant that according to actual count two business houses used the telephone forty-nine and forty-three times, respectively, in a day, while two residences used it five and three times, respectively. It is not likely that the figures thus presented represent an average, as the business houses selected were two of the busiest on the applicant's line; but there is no doubt that the number of calls to and from business houses is several times as great as the number of residence calls. Without going into a detailed separation of expenses between fixed and variable, we may safely say that there is a sound basis in the cost of operation for some difference of rates between business and residence telephones.

Moreover, it is generally true, at least in the smaller cities and villages, that in order to make it worth while for business houses to use the telephone, the community must be well supplied with residence phones, and this in itself often necessitates a lower rate for residence than for business telephones.

These principles have heretofore been recognized by this Commission in various decisions. *In re Free and Reduced Rate Telephone Service,* 2 W. R. C. R. 521, 542, the Commission says:

"The classification of telephone subscribers into 'residence' and 'business' subscribers, with higher rates for the latter than for the former, is lawful and permissible, not only from the point of view of the greater cost of providing the business service, but also because of the co-ordinate principle that a lower residence rate is necessary in order that a sufficiently large number of subscribers may be secured to make the telephone valuable to business subscribers."

Again, in *Payne v. Wis. Tel. Co.* 4 W. R. C. R. 1, 56, 57—58, the Commission says:

"The proposition seems to be so well established as to be almost axiomatic, that the business telephone must bear more than its proportionate share of the expense in order that there may be residence telephones; theoretically, at least, the residence telephones add value to the service of the business telephones, so that, from the standpoint of the value of the service, business subscribers may have no cause to complain. * * * There is , of course, another ground upon which to justify such a schedule of charges, namely, the greater expense of handling the traffic of business telephones. The business telephone makes a greater demand upon the operating force than the residence telephone in a majority of cases, perhaps, though in communities which are socially active the difference in amount of use may not be so marked. To whatever extent this difference does exist, it undoubtedly justifies a difference in rates. A disparity between rates which is based upon the cost of producing service is logical, and, in fact, no disparity at all. Cost of service is the best test of the reasonableness of rates, provided it is commercially feasible and otherwise equitable."

It appears to be fair, then, that business telephones should pay higher rates than residence telephones. At the same time, the present financial condition of the applicant is such that any very considerable increase in its revenues would not be justifiable. Unless the business and residence rates are to be separated by lowering the residence rates, the present circumstances will not admit of a very radical difference between business and residence rates. The rates which the applicant proposes for business lines amount to $24 per year for single business lines, and since it appears that there are no party business lines, this rate would, for the present at least, be the only business rate in use. This increase of $9 per telephone, or 60 per cent, on business lines would enhance the total revenue of the company by nearly $300 per year, which appears to be more than is necessary to insure a reasonable return upon the investment, after meeting all legitimate expenses. Moreover, so radical an increase in the cost of business telephones might in some cases make it difficult for the company to obtain or even to retain business subscribers, and thus do as much or more injury than good to the company itself. On the whole, it seems that the increase of rates as proposed by the applicant is excessive, and that a net single line business rate of $18 per year is sufficient. Upon the basis of the number of installations reported at the hearing, and assuming the revenue from outgoing toll calls to be about the same as that estimated for 1911 in table I, the revenues of the applicant under these rates should be about as follows:

REVENUES AND EXPENSES UNDER PROPOSED RATES.

30 business telephones at $18	$540
56 business telephones at $15	840
154 rural telephones at $12	1,848
6 business extensions at $6	36
Earnings from connecting lines	250
Total revenue	$3,514
Total operating expense (as given in table I)	2,057
Net revenue available for interest and depreciation	$1,457
Or, on $9,727.56 valuation, 14.98%.	

That the proposed rate of $18 for single line business telephones is not out of line with the general average of rates in villages the size of Pewaukee, either as being too high or too low, is indicated by the results of table III. This table gives the single line business and residence rates for 31 villages and cities of about the size of Pewaukee, and the average of these localities, as to business rates, is surprisingly close to the business rate of $18 suggested above.

TABLE III.

SINGLE LINE RATES IN VARIOUS VILLAGES AND CITIES.

Location.	Population. 1905.	Single Line Rates.	
		Business.	Residence.
Abbotsford	893	$18	$12
Amery	753	18	12
Bangor	695	12	12
Birnamwood	701	18	12
Boyd	682	12	12
Butternut	707	18	12
Cadott	760	18	12
Cashton	673	15	12
Chetek	730	18	12
Edgar	753	18	12
Fairchild	806	12	12
Frederick	683	18	12
Genoa Junction	710	48	36
Hartland	673	36	24
Hillsboro	804	18	12
Hortonville	890	30	18
Kewaskum	693	12	12
Marion	746	18	12
Menomonee Falls	936	13.20	7.80
Milton	810	24	18
Oregon	703	24	18
Palmyra	710	24	24
Pardeeville	866	12	12
Plainfield	829	10	10
Prairie du Sac	671	15	12
Soldiers' Grove	718	12	12
West Salem	868	18	12
Westby	767	18	12
Whitehall	700	12.50	....
Winneconne	942	12	12
Wonewoc	587	12	12
Average, 31 localities	760	$18.18	$13.99
Pewaukee	763	$18.00	$15.00

Since a business rate of $18 for single line telephones will conform to the recognized principle that business telephones should pay more than residence telephones, will apparently place the applicant's net revenues at about the proper point for an adequate return on the investment after meeting all legitimate expenses, and will at the same time correspond very closely to the average single line business rates in other villages about the size of Pewaukee, there seems to be no reason why such rate should not be made effective.

As to party lines, it will be seen from an examination of the present schedule that the rate for lines of less than six parties is the same as the single line rate. The natural result of this is that there are practically no such party lines in use, since the single line is generally more satisfactory. If the increase of the business single line rate to $18 were not accompanied by a corresponding increase in the party line rate, the probable result would be that many of the business houses would take a two or three party line and thus pay the same rate as before. The same reasons exist in the case of party as of single lines for the difference between business and residence rates, and therefore it is quite proper that the increase in the single line business rate should be accompanied by an increase in the party line rates from $12 and $15 to $15 and $18, respectively.

At the hearing, the applicant requested a ruling from the Commission as to the status of physicians' telephones when placed in a residence or an office which is a part of a residence. There is no doubt that where a physician has a detached office, his telephone located therein is a business telephone. And, as the Commission has already said, *In re Free and Reduced Rate Telephone Service,* 2 W. R. C. R. 521, 544, "Where the place of business and the residence of a subscriber are in the same premises and no telephone is installed in the place of business, the business rate should be charged for the telephone installed in the residence." It follows logically from these principles that where a physician or other subscriber uses a residence telephone primarily for business purposes, he should pay a business rate. The controlling fact in determining whether the telephone is a residence or business telephone, for rate purposes, is the character of the use which is customarily made of it. While in some cases the line may be close and the real character of the use somewhat doubtful, in the case of a subscriber whose use of the instrument is so clearly a business use as is that of a physician, there is no doubt that the business rate should apply, although, by accident or design, the subscriber has had the telephone installed where residence telephones are ordinarily installed. The case would be different if the subscriber had a detached office in which was located a business telephone, and had also a telephone in his residence which was at times incidentally used for business purposes.

At the time of the hearing, the applicant amended its application by including in the new rate schedule a summer business rate. It has at present in effect a summer residence rate equal to two-thirds of the annual residence rate; and, although it now has no summer business subscribers, it desires to make provision for them in about the same proportion. This seems to be a justifiable accompaniment of the general increase in business telephone rates, and will therefore be authorized. However, instead of being based upon the $24 rate applied for, the summer rate will be based upon the $18 rate herein authorized, and will be fixed at $12.

In accordance with the established practice of the applicant, as authorized by this Commission *In re Application of the Pewaukee-Sussex Telephone Co.* 3 W. R. C. R. 420, the rates authorized will be fixed $3 higher in each case than the net rate, and a discount of $3 per year will be allowed for payment quarterly in advance.

It is Therefore Ordered, That the applicant, the Pewaukee-Sussex Telephone Company, be and the same is hereby authorized to add to its present schedule of rates the following rates for business telephones:

Business telephones, single line in village, $21 per year; discount of $3 per year for payment quarterly in advance.
Business telephones, party lines of six or less, $21 per year; discount of $3 per year for payment quarterly in advance.
Business telephones, party lines of ten or more, $18 per year; discount of $3 per year for payment quarterly in advance.
Business telephones, single line, for summer season only, $15 per season; discount of $3 per season for payment in advance.

CITY OF NEENAH
vs.
THE WISCONSIN TRACTION, LIGHT, HEAT AND POWER COMPANY.

Decided Aug. 4, 1911.

Petition alleging that the rates for gas in the city of Neenah are unreasonable, unjust and unlawful. The respondent supplies gas to Neenah and Menasha from its Appleton plant, and in addition to its gas plant operates an electric light plant and an interurban and street railway system. The value of the entire gas plant is found and apportioned between Appleton and Neenah and Menasha. The balance sheets, revenues, and expenses are given and discussed. Comparison is made with other cities of the same class in gas sales, number of consumers, miles of main, sales per capita, sales per consumer, consumers per mile, etc. On a basis of a return for interest and profit of 7½ per cent on a valuation of $320,000,

It is ordered: That the respondent reduce its rates and put in effect the schedule named. It is recommended that such schedule be also made effective in the cities of Menasha and Appleton.

The petition and complaint of the above named city of Neenah, by C. D. Cleveland, its attorney, alleges, among other things, that the charge made by the said Wisconsin Traction, Light, Heat and Power Company for gas for heating and lighting purposes in the city of Neenah is unreasonable, unjust, and unlawful, and asks that the Commission, after due hearing and investigation, ascertain reasonable, just, and lawful rates and order the respondent company to conform thereto.

Pursuant to notice a hearing was held in the office of the Commission on March 15, 1910, at which hearing the following appearances were entered: *C. D. Cleveland* for the petitioner and *C. M. Rosecrantz* for the respondent.

DESCRIPTION OF PROPERTY.

The gas delivered by the respondent company in Neenah and Menasha is generated in Appleton at the same station which supplies the last named city. The generating station for the manufacture of this gas is located on lots 6 to 12, inclusive, block C, Appleton. The plant consists of four benches of half-depth, rear-clinkered sixes, together with the necessary condensing and purifying equipment, and a concentrator for the recovery of ammonia. There is, in addition, an auxiliary five foot water gas set with exhauster, condensers and small relief holder. The storage holder has a capacity of about 100,000 feet. In addition to the equipment just mentioned, two compressors are installed for pumping the gas under high pressure to Neenah and Menasha. The buildings and coal sheds are of the usual type.

A high pressure line supplies all the gas used in Neenah and Menasha and in one ward of Appleton, through which the line passes. Within the cities of Neenah and Menasha the pressure is reduced by district governors and the gas is distributed through a series of low pressure mains.

The physical property situated in Neenah and Menasha consists of the district governors, the low pressure mains, services and meters, together with a small amount of office equipment at the local collection office. A holder was formerly in use in Neenah, but at present it is out of commission and could not again be put in service without extensive repairs.

RATES NOW IN FORCE.

The following is the schedule of rates on file with the Commission and agrees with the schedule mentioned in the complaint:

SCHEDULE OF THE GAS RATES OF THE WISCONSIN TRACTION, LIGHT, HEAT AND POWER COMPANY IN FORCE IN NEENAH AND MENASHA.

Gas Illuminating Rates.

First	3,000 cu ft.,	$1.45 per M cu. ft.
Next	3,000 "	1.40 " " "
"	3,000 "	1.35 " " "
"	3,000 "	1.30 " " "
"	3,000 "	1.25 " " "

All above 15,000 cu. ft., $1.25 per M cu. ft.

No further discounts on bills for illuminating gas.

Minimum charge of 25 cts. per meter when the consumption does not equal 25 cts.

Gas Fuel Rates.

First	10,000 cu. ft.	$1.30 per M cu. ft.
Next	10,000 "	1.20 " " "
"	10,000 "	1.10 " " "
"	20,000 "	1.00 " " "

All over 50,000 cu. ft., $0.90 per M cu. ft. 10 cts. per M discount for cash within ten days.

Minimum charge of 25 cts. per meter when the consumption does not equal 25 cts.

VALUE OF THE PLANT.

A tentative valuation of the gas property of the Wisconsin Traction, Light, Heat and Power Company has been made by the engineering staff of the Commission as of date Jan. 1, 1910, and is reproduced below.

TABLE I.

TENTATIVE VALUATION OF THE PHYSICAL PROPERTY OF THE GAS DEPARTMENT OF THE WISCONSIN TRACTION, LIGHT, HEAT AND POWER COMPANY,

AND APPORTIONMENT BETWEEN APPLETON AND NEENAH AND MENASHA.

Classification.	Appleton.		Neenah & Menasha		Total.	
	Cost of reproduction.	Present value.	Cost of reproduction.	Present value.	Cost of reproduction.	Present value.
1. Land	$3,097	$3,097	$1,463	$1,463	$4,560	$4,560
2. None	....	....	....	....	....	....
3. Holders	12,875	11,037	4,835	4,145	17,710	15,182
4. Distribution system	117,428	107,378	68,653	63,270	186,081	170,648
5. Gas plant equip	20,478	15,022	9,599	6,895	30,077	21,917
6. Bldgs. and misc. struc.	12,536	9,734	6,948	5,449	19,484	15,183
7. Office furn. and appl.	483	414	322	275	805	689
8. Tools and inst	1,598	956	722	439	2,320	1,395
9. Horses, wagons and misc	1,068	891	70	55	1,138	948
Total items 1-9	$169,563	$148,529	$92,612	$81,991	$262,175	$230,520
10. Add 12% (see note bel.)	20,348	17,823	11,113	9,839	31,461	27,662
Total items 1-10	$189,911	$166,352	$103,725	$91,830	$293,636	$258,182
11. Stores and supplies:						
Appl. for sale	2,926	2,926	835	835	3,761	3,761
For company's use	3,448	3,448	1,295	1,295	4,743	4,743
Total items 1-11	$196,285	$172,726	$105,855	$93,960	$302,140	$266,686
12. Paving	8,585	7,992	1,502	1,415	10,087	9,407
Total items 1-12	$204,870	$180,718	$107,357	$95,375	$312,227	$276,093

NOTE:-Addition of 12% to cover engineering and superintendence, interest during construction, contingencies, etc.

In this instance it was necessary to appraise the entire property used in the gas business in the three cities and to apportion this property between that used in Appleton and that used in Neenah and Menasha. The apportionment between Appleton and Neenah and Menasha was made upon the basis of gas sales in the respective cities during the year 1909. In this report no separation of property as between Neenah and Menasha was made. Only one collection office is maintained for the two cities, and the conditions are such that it appeared that any conclusions which would apply to one must also apply to the other.

The respondent company is also engaged in the generation and distribution of electricity for light and power in the three cities and the operation of an electric railway which serves these cities and Kaukauna. The only property used jointly by the gas and other utilities is the office building in Appleton. Of this property one-half was assigned to the gas utility, the apportionment being made on the basis of space occupied. The valuation placed upon the property and the apportionment between Appleton and Neenah and Menasha, as made by the engineer of the Commission, was accepted as substantially correct by both the petitioner and the respondent. Under the circumstances, but little comment need be made upon the valuation of the property. The holder in Neenah has been excluded from the valuation as non-operative property.

The item of paving amounts to $10,087. Since this estimate includes the paving above existing mains and services at the date of the valuation, it should be decreased somewhat, inasmuch as this Commission has held in previous cases that no allowance should be made for paving except where same was actually disturbed by the company. (This is discussed in detail in the decision *City of Ripon v. Ripon Lt. & Water Co.* 5 W. R. C. R. 1, 10.) The amount of paving actually disturbed by the company in this case has not been determined, but the item is small and does not appreciably affect the result.

In fixing the value of a property for rate-making purposes, consideration should be given, on the one hand, to the ability of the utility to meet the reasonable demands placed upon it by its consumers, and to the existence of investment beyond the reasonable demands of the present or near future on the other. Comparisons of the investment here and in other cities of the state show that the investment at the station is quite low. As a matter of fact, the company at present needs additional condenser and holder capacity and will soon require additional generating capacity. The investment in the distribution system per mile of main, or per consumer, is not large, but per thousand cubic feet sales, is somewhat above the average. This is due, however, to the fact that the sales per mile of main are at present below the average rather than to an extravagant investment. It may be said, therefore, that the investment of the respondent company, as viewed in the light of local conditions, is not only reasonable, but that in the near future additions will be necessary to meet the demands of the public.

TABLE II.

SALES STATISTICS FOR WISCONSIN GAS PLANTS IN CITIES OF OVER 10,000 POPULATION.

FROM 1910 REPORTS TO RAILROAD COMMISSION.

City.	Gas sales in M cu.ft.	Total consumers	Miles of mains.	Total meters	Sales per capita.	Sales per consumer.	Sales per meter.	Consumers per mile of main.
A..	14,602.0	874	14.54	939	1,260	16,710	10,040	60.11
Applet-Neen-Men..	62,743.8	3,364	54.88	4,873	2,220	18,650	11,430	61.30
B	47,610.5	1,790	28.50	1,802	3,145	26,600	16,710	62.81
C	37,077.9	2,559	35.43	2,561	2.025	20,250	10,465	72.23
D	43,534.0	2,598	35.00	2,602	2,315	23,160	12,438	74.23
E	48,765.1	2,501	38.61	3,378	1,930	14,480	12,630	64.78
F	48,817.8	2,641	29.73	2,646	3,515	18,480	16,420	88.83
G	94,565.1	3,177	32.04	4,644	4.425	29,760	29,515	99.15
H	72,387.3	3,169	40.64	3,146	2,340	22,850	17,812	77.97
I	129,496.4	4,768	47.08	4,827	5,070	27,160	27,506	101.27
J	37,502 8	1,929	26.76	1,943	2,880	19,440	14,014	72.08
K	11,550.0	594	12.28	....	790	19,440	9,406	48.31
L	76,932.0	3,827	37.28	6,168	2,330	20,100	20,636	102.66
M	182,467.0	6,992	66.61	11,238	4,800	26,100	27,393	104.96
N	37,158.3	2,645	30.57	2,649	1,405	14,050	12,155	86.52
O	55,907.7	3,259	23.12	3.266	1,385	17,150	24,182	....
P	21,308.9	1,301	21.57	1,341	1,285	16,380	9,879	60.32
Maximum	....	....	....	....	5,070	29,760	29,515	104.96
Average	....	....	....	....	2,538	20,633	16,625	77.35
Minimum	....	....	....	....	790	14,050	9,406	60.11

Sales per capita, sales per consumer and consumers per mile of main in Appleton-Neenah-Menasha, are all somewhat below the average for class A plants in the state. Sales per capita is 2,220 as compared with 5,070 for Madison and 4,800 for Racine. Sales per consumer is 18,650 as compared with 27,160 for Madison and 26,100 for Racine. Consumers per mile of main number 61.3 as compared with 101.27 for Madison and 104.96 for Racine.

Comparative statistics for a number of years will show the growth of respondents gas business. The figures given are for calendar years:

GAS SALES STATISTICS (1905-1910).

Year.	Gas sold M cu. ft.	Consumers per mile of main.	Gas sold per consumer, M cu. ft.	Gas sold per mile of main, M cu, ft.
1905	42,298	51.9	19.49	1,014
1906	48,541	52.7	19.70	1,040
1907	53,605	54.4	19.85	1,083
1908	56,540	56.3	19.19	1,080
1909	60,203	59.0	18.98	1,123
1910	65,107	61.1	19.10	1,170

It will be noted that while the sales per consumer have remained practically the same during the period covered, that the number of consumers per mile of main has shown a steady growth. The increase in business appears to be largely a matter of new consumers rather than increased sales to existing customers.

TABLE III.

BALANCE SHEETS.

Wisconsin Traction, Light, Heat and Power Company.

GAS UTILITY.

	Year ending	
	June 30, 1909.	June 30, 1910.
ASSETS		
Cost beginning of the year	$543,054.82	$563,445.68
Construction and equipment during year	10 889.22	8,982.12
Cost close of year	$553,954.04	$572,427.80
Treasury stock unissued	81,162.00	81,162.00
Stocks and bonds of other companies	202 50	405.00
Cash on deposit to redeem underlying bonds	15,000.00	15,000.00
Special funds	4,590.00	11,610.00
Cash	16,542.67	12,750.91
Bills receivable	6,293.91	6,485.84
Accounts receivable	1,905.68	7,256.56
Cash on deposit to pay interest coupons	7,033.50	6,966.00
Material and supplies	8,069.55	10,968.45
Prepaid insurance	488.20	322.97
Total assets	$695,232.05	$725,375.53
LIABILITIES		
Capital stock common	$270,000.00	$270,000.00
Funded debt	368,550.00	368,550 00
Depreciation reserve fund	4,953 30	6,070.27
Maintenance reserve fund	....	3,871.62
Special funds—reserves	8,913.48	9,921.56
Accounts payable	6,082.48	12,189.53
Matured interest on funded debt unpaid	....	6,968.00
Deposits	....	105.06
Taxes accrued	6,529.95	2,592.79
Unmatured interest on funded debt accrued	8,255.25	1,221.75
Surplus	22,847.59	43,886.95
Total liabilities	$695,232.05	$725,375.53

The foregoing statements are as taken from the last two annual reports of the company to this Commission. No separate balance sheets were made for the separate utilities of respondents business prior to the time when the "Uniform Classification of Accounts" for public utilities in Wisconsin was prescribed by the Commission. The following memorandum appears in the company's annual gas utility reports relative to the division of the assets and liabilities of the property as a whole beween the several utilities:

> "This company is engaged in the electric railway, electric lighting and power, and gas business. On its books of account, 'Gross earnings' and 'Operating expenses,' for each branch of the business, respectively, are kept separate and distinct, and the same is true with respect to 'Income from sources other than operation.' 'Fixed charges' and 'Deductions from income,' although to a certain extent the separation is determined, in part, by an apportionment, which in a way is arbitrary, although based on what is considered a fair and equitable basis.
>
> "As to the 'Assets' and 'Liabilities,' no attempt at separation has been made on the books of the company, other than with respect to such items as relate specifically to one branch of the business or the other, as the case may be, as for example, 'Depreciation reserve railway,' 'Depreciation reserve electric lighting,' 'Depreciation reserve gas.' In order to furnish the information called for by the three reports, in furnishing the information, the 'Assets' and 'Liabilities' other than those which are specifically 'Railway,' 'Lighting' or 'Gas,' have been apportioned as 'Income from sources other than operation.' 'Fixed charges' and 'Deductions from income' were apportioned. In other words, the accounts of the company, as treated on its books, have been made to conform to the reports as well as the company is able to make them conform, and furnish the information asked for as laid down in the reports."

In table IV, which follows, the balance sheets of the respondent for the separate utilities, and a combined statement for the utility as a whole, is shown for the years ending June 30, 1909 and June 30, 1910. A percentage distribution of the various items contained in the assets and liabilities is also shown:

TABLE IV

BALANCE SHEET.

WISCONSIN TRACTION, LIGHT HEAT AND POWER COMPANY.

	Year ending June 30, 1909.							Year ending June 30, 1910.							
	Railway.		Gas.		Electric.		Total Amount.	Railway.		Gas.		Electric.		Total Amount.
	Per ct.	Amount.	Per ct.	Amount.	Per ct.	Amount.		Per ct.	Amount.	Per ct.	Amount.	Per ct.	Amount.	
ASSETS.															
Property and Plant:															
Cost beginning of year	40	$883,057 60	25	$543,054 82	35	$770,755 74	$2,196,868 16	40	$897,550 83	35	$563,445 68	35	$796,390 24	$2,257,386 75
Construction & equip. current fiscal year	64	38,879 76	18	10,889 22	18	10,808 21	60,577 19	65	56,508 64	10.2	8,982 12	24.8	21,148 89	86,639 65
Cost close of year	40.9	$921,927 36	24.5	$553,944 04	34.6	$781,563 95	2,257,445 35	41	$954,059 47	24	$572,427 80	35	$817,539 13	$2,344,026 40
Treasury Securities:															
Treasury stock unissued	39	117,234 00	27	81,162 00	34	102,204 00	300,600 00	39	117,234 00	27	81,162 00	34	102,204 00	300,600 00
Treasury bonds	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Investments:															
Stocks and bonds of other co's.	54	1,312 50	8	202 50	38	935 00	2,450 00	50	1,605 00	13	405 00	37	1,190 00	3,200 00
Other investments	....	....	100	15,000 00	....	....	15,000 00	....	....	100	15,000 00	....	....	15,000 00
Reserve, Sinking & Special Fund Assets:															
Depreciation reserve fund	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sinking fund	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Amortization reserve fund	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Special funds	39	6,630 00	27	4,590 00	34	5,780 00	17,000 00	39	16,770 00	27	11,610 00	34	14,620 00	43,000 00
Current Assets:															
Cash	42.4	34,054 46	20.6	16,542 67	37	29,688 51	80,285 64	39	18,417 97	27	12,750 91	34	16,056 70	47,225 58
Notes and bills receivable	....	....	49.8	6,293 91	50.2	6,374 15	12,668 06	....	....	70	6,485 84	30	2,804 53	9,290 37
Accounts receivable	39	2,752 64	27	1,905 68	34	2,399 74	7,058 06	4.5	646 35	47.5	7,256 56	48	7,270 76	15,173 67
Int. and dividends receivable	....	....	....	....	....	....	....	53	10,062 00	....	....	47	8,772 00	18,834 00
Material and supplies	31	6,673 22	37	8,069 55	32	6,991 09	21,733 86	34.5	12,072 33	31.3	10,988 45	34.2	12,018 82	35,079 60
Miscellaneous current assets	....	....	100	7,033 50	....	....	7,033 50	....	....	100	6,966 00	....	....	6,966 00
Prepaid Accounts:															
Prepaid insurance	39	705 17	27	488 20	34	614 76	1,808 13	39	466 51	27	322 97	34	406 70	1,196 18
Prepaid taxes	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Prepaid interest	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sundry prepaid accounts	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Open accounts	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Deficits	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total assets	40	$1,091,290 35	26	$695,232 05	34	$936,551 20	$2,723,082 60	40	$1,131,333 63	25.5	$725,375 53	34.5	$982,882 64	$2,839,591 80

LIABILITIES.														
Capital Liabilities:														
Capital stock preferred														
Capital stock common	39	$390,000 00	27	$270,000 00	34	$340,000 00	$1,000,000 00	39	$390,000 00	27	$270,000 00	34	$340,000 00	$1,000,000 00
Funded debt	39	532,350 00	27	368,550 00	34	464,100 00	1,365,000 00	39	532,350 00	27	368,550 00	34	464,100 00	1,365,000 00
Mortgage Liabilities:														
Real estate mortgages														
Other mortgages														
Reserve, Sinking & Special Fund Liabilities:														
Depreciation reserve fund			28	4,053 30	78	10,341 69	14,394 99	7.7	2,143 32	21.8	6,070 27	71	19,609 77	27,823 36
Sinking fund										100	3,871 62			3,871 62
Amortization reserve fund														
Special funds—reserves	36.5	10,787 97	30	8,913 48	33.5	9,853 98	29,555 43	38.2	16,044 00	23.8	9,921 56	38	15,960 86	41,926 42
Current Liabilities:														
Bills payable	39	8,785 80	27	6,082 48	34	7,659 41	22,527 69	59	17,607 11	40	12,189 53			29,796 64
Accounts payable												100	15,349 78	15,349 78
Matured interest on funded debt unpaid								39	10,062 00	27	6,966 00	34	8,772 00	25,800 00
Matured interest on notes and bills unpaid														
Dividends unpaid														
Deposits					100	128 61	128 61			50	105 06	50	105 07	210 13
Misc. current liabilities														
Accrued Liabilities:														
Accrued insurance														
Taxes accrued	39	9,432 14	27	6,529 95	34	8 222 89	24,184 98	39	3,745 14	27	2,592 79	34	3,265 00	9,602 93
Unmatured interest on funded debt accrued	39	11,924 25	27	8,255 25	34	10,395 50	30,575 00	39	1,764 75	29	1,221 75	34	1,538 50	4,525 00
Unmatured interest on notes and bills payable														
Dividends accrued														
Misc. liab. accrued														
Unredeemed tickets	100	466 31					466 31	100	439 28					439 28
Accrued sundry liabilities														
Open accounts														
Surplus	54	127,552 88	9.7	22,847 59	36.3	85,849 12	236,249 59	50	157,178 03	14	43,886 95	36	114,181 66	315,246 64
Total liabilities	40	$1,091,299 35	26	$695,232 05	34	$936,551 20	$2,723,082 60	40	$1,131,333 63	25.5	$725,375 53	34.5	$982,882 64	$2,839,591 80

TABLE V.

DETAILED INCOME ACCOUNTS.

WISCONSIN TRACTION, LIGHT, HEAT AND POWER COMPANY.

Gas Utility.

Italic figures denote credits.

	Year ending June 30, 1909.	Year ending June 30, 1910.
OPERATING REVENUES:		
Illuminating gas sales	$28.329 86	$28.554 55
Fuel gas sales	44,883 94	50,746 30
Meter rental, etc	1,215 39	1,201 24
Total sales	$74,429 19	$80,502 09
Earnings from residuals:		
Coke	$17.139 35	$16,943 06
Tar	1,524 84	2,179 98
Ammonia	573 90	713 36
Total residuals	$19,238 09	$19.836 40
Total operating revenues	$93,667 28	$100.338 49
OPERATING EXPENSES:		
Production:		
Coal gas:		
Superintendence	$2.639 96	$1.109 03
Retort house labor		3,283 18
Purifying labor	3,662 06	202 90
Miscellaneous labor		5 78
Coal carbonized	25,486 18	23,102 16
Bench fuel	5,984 46	5.329 44
Steam		2,385 70
Retort house supplies and expenses		133 90
Coal gas purification supplies and exp	332 49	39 07
Misc. coal gas supplies and expenses		*177 07*
Maint. of benches		123 78
Maint. coal gas apparatus		359 52
Maint. coal gas bldgs., fix. and grounds	756 38	18 82
Total coal gas production	$38,861 53	$35.916 21
Water gas:		
Superintendence	$111 11	$230 02
Generator house labor	97 90	376 65
Steam for generating water gas		425 46
Generator fuel	469 75	1,166 42
Enricher	580 26	1,457 69
Water gas purification supplies and expenses		5 55
Misc. water gas supplies and expenses	*225 49*	38 20
Maint. water gas apparatus		184 03
Maint. water gas bldgs, fix. and grounds	54 89	3 50
Total water gas production	$1,088 42	$3,887 52
Total production	$39,949 95	$39.803 73
Distribution:		
Labor removing and resetting meters		$352 72
Street department labor		58 50
Meter and fitting department labors		285 56
Customers' premises expenses	$2.597 55	$2.594 86
Pumping gas	240 25	321 48
Street dept. supplies and expenses	89 63	146 01
Meter and fittings dept. supplies and exp		63 00
Misc. distribution supplies and expenses		1,046 57
Maintenance of mains	809 07	161 20
Maint. of services		157 13
Maint. of meters	1,262 40	1,457 23
Maint. distribution bldgs., fixtures & grounds	904 76	
Total distribution	$5,903 66	$6,644 26

TABLE V—Concluded.

DETAILED INCOME ACCOUNTS.

WISCONSIN TRACTION, LIGHT, HEAT AND POWER COMPANY.

Gas Utility.

Italic figures denote credits.

	Year ending June 30, 1909.	Year ending June 30, 1910.
OPERATING EXPENSES, Concluded:		
Commercial:		
Collection salaries and commissions	....	$160 33
Reading meters and delivering bills	$655 05	462 22
Collection supplies and expenses	....	2 00
Uncollectible accounts	212 36	313 74
Promotion of business reserve	1,358 22	925 04
Promotion of business supplies & exp.-reserve	181 07	925 04
Total commercial	$2,406 70	$2,788 37
General:		
Salaries of general officers	$1,527 00	$990 00
Salaries of general office clerks	3,115 10	2,854 70
General office rent	246 81	188 34
General office supplies and expenses	891 97	549 90
Law expenses general—reserve	577 30	627 43
Misc. general expenses	632 65	458 26
Maint. general office equipment	....	50
Maint. general office bldgs., fixtures & grounds	....	4 02
Total general	$6,990 83	$5,673 15
Undistributed:		
Injuries and damages—reserve	$667 76	$670 40
Insurance—reserve	821 96	856 79
Stationery and printing	487 43	562 99
Operation of stores department	....	151 86
Maint. stores department equipment	240 41	7 56
Maint. stores dept. bldgs., fixtures & grounds	....	91
Operation of utility equipment	1,471 33	1,119 51
Maint. utility equipment	....	275 67
Total undistributed	$3,688 89	$3,645 69
Total above items	$58,940 03	$58,555 20
Depreciation	4,359 34	4,133 60
Maintenance reserve	....	3,871 62
Taxes	4,313 28	4,721 83
Total operating expenses	$67,612 65	$71,282 25
Net operating revenue	$26,054 63	$29,056 24
Non-operating revenues	3,315 11	3,994 61
Gross income	$29,369 74	$33,050 85
DEDUCTIONS FROM GROSS INCOME:		
Interest on funded debt	$18,468 00	$18,468 00
Total deductions	$18,468 00	$18,468 00
Net income available for dividends	$10,901 74	$14,582 85

The detailed income accounts shown in the foregoing table are as reported by the company in its annual reports to the Commission. It has been noted that the respondent operates three utilities, namely, electric railway, electric lighting and power, and gas. Certain items of expense are incurred for a single utility and are therefore entirely chargeable to that utility. Production expenses in the gas plant are of this nature. Other items are common to two or all three utilities and must be apportioned between the plants on some fair and equitable basis. Among this class of expenses the "General" and "Undistributed" expenses are prominent.

The charge for taxes, insurance, injuries and damages, legal expenses, bad debts and promotion of business expenses, appear in the income account in the amount of the credits to reserve accounts set up by the respondent for these expenses. A maintenance reserve of $3,871.62 appears in the income account for the year ending June 30, 1910. This amount constitutes a credit to a "Maintenance reserve account" established during that period. No debits to this account appear during the year. Actual maintenance charges were paid out of the revenues and appear in the operating expenses in their proper places.

Careful inquiry has been directed into the various other reserve accounts established by respondent, and the credits and debits to these accounts, together with the balance at the close of each year, have been taken from respondent's books. Comparisons with the expenses incurred by similar plants in the state have been made, extending over a series of years of operation. These and other investigations indicate that respondent's credits to the several reserve accounts mentioned have been more than ample to meet the obligations incurred, and that the amounts thus set aside may, perhaps, be safely reduced somewhat for purposes of arriving at a fair cost of service as a basis of rates.

Examination of respondent's apportionment of the general and undistributed expenses between the three utilities disclosed that while the apportionment does not agree exactly with a division made on the basis of the direct expenses of the three utilities, that the amount allotted to the gas department, while somewhat less than a strict division on the direct expenses would bring about, is not far out of line on such a basis and need not be disturbed.

In the following table VI the earnings of the respondent since July 1, 1904, when the respondent first began to sell gas, have been computed on a basis of the cost new of the physical property as given in the tentative valuation. Additions to the property, as shown by the respondent's books, have been deducted from the tentative valuation to arrive at the average plant value for each year shown in the table. Earnings from operation do not include earnings from the sale of residuals, these amounts having been deducted from total operating expenses to obtain the amounts given in the table. Taxes are as shown in respondent's statements and constitute the amount apportioned to the gas utility. Depreciation is as computed on a basis of about 1½ per cent on the cost new of the total property.

Average plant value, while not including any allowance for working capital over and above the stores and supplies on hand, does include all stores and supplies, including appliances for sale, and also includes all the paving, whether actually cut through and replaced by respondent or not so cut through and replaced. The computation made will quite closely indicate the earning value of the utility during the period covered.

TABLE VI.

COMPARATIVE EARNINGS.

WISCONSIN TRACTION, LIGHT, HEAT AND POWER CO.

	1910.	1909.	1908.	1907.	1906.	1905.	*1904.
Total earnings from operation	$83,613 69	$77,391 80	$72,775 56	$68,873 94	$62,590 00	$55,593 35	$26,646 09
Total operating expenses	40,151 16	38,060 15	40,266 88	42,811 06	38,479 10	33,589 16	16,043 77
Surplus	$43,462 53	$39,331 65	$32,508 68	$26,062 88	$24,110 90	$22,004 19	$10,602 32
Taxes	$4,557 56	$4,816 00	$3,957 66	$3,267 19	$2,912 41	$2,543 33	$1,199 92
Depreciation	4,752 97	4,625 52	4,495 74	4,360 20	4,129 11	3,650 73	3,260 98
Total above two items	$9,310 53	$9,441 52	$8,453 40	$7,627 39	$7,041 52	$6,194 06	$4,460 90
Net income from operation	$34,152 00	$29,890 13	$24,055 28	$18,435 49	$17,069 38	$15,810 13	$6,141 42
Average value plant for yr.	$316,865	$308,368	$299,716	$290,680	$275,274	$243,382	$217,399
Rate of return on investment after deducting allowance for depreciation	*10.8%*	*9.7%*	*8.03%*	*6.3%*	*6.2%*	*6.5%*	*2.8%*

*Date when company first began to sell gas—July 1, 1904.

No information is available in regard to the original cost of the property covered in this proceeding. A substantial agreement between the parties appears as regards the valution of the physical property as determined by the staff as of date Jan. 1, 1910. Careful investigation discloses that the plant has been efficiently and economically operated. The service rendered by respondent is found to be reasonably adequate and satisfactory. Certain additions and betterments are required to adequately meet the demands of the consumers in the immediate future.

In view of these facts in regard to the adequacy of the service rendered by, the investment in, and the operation of respondent's plant, and in view of the facts as regards the present value, the cost of reproduction, original cost, and book value of respondent's property, together with consideration of such elements as working capital and the earning value of the plant, it is believed that, for the purposes of our computations herein, respondent is entitled to a return for interest and profit of about 7½ per cent on a valuation of about $320,000.

After consideration of the elements described and the facts in regard to the operating revenues and expenses of the company, among other facts, it is believed that the following rate schedule is reasonable and adequate under the conditions:

$1.15 per M cu. ft. for the first 5 M cu. ft.
$1.00 per M cu. ft. for the next 15 M cu. ft.
$0.90 per M cu. ft. for the next 30 M cu. ft.
$0.75 per M cu. ft. for all in excess of 50 M cu. ft.

Respondent now sells gas under what is known as the "double meter" system, with fuel and illuminating gas sold under two separate and distinct schedules of rates. It is not believed that the conditions call for a continuation of this practice in the territory supplied by respondent, and the schedule proposed herein applies to all gas sold for whatever purpose used.

The following table shows the "consumer" expenses for the years ending June 30, 1909, and June 30, 1910. The significance of these unit costs has been discussed in previous decisions and the repetition of that material herein does not appear necessary. *City of Racine v. Racine Gas Lt. Co.* 6 W. R. C. R. 228, 309-317. The figures given therein, together with those given in the following table, furnish a basis for the establishment of a graduated minimum charge:

TABLE VII.

CONSUMER EXPENSES.

Wisconsin Traction, Light, Heat and Power Co.

	Year ending	
	June 30, 1909.	June 30, 1910.
Labor, removing and resetting meters		$352 72
Meter and fittings department labor		285 56
Customers' premises expenses	$2,597 55	2,594 86
Meter and fittings department supplies and expenses		63 00
Maintenance of services		156 13
Maintenance of meters	1,262 40	1,457 23
Collection salaries and commissions		160 33
Reading meters and delivering bills	655 05	462 22
Collection supplies and expenses		2 00
Uncollectible accounts	212 36	313 74
Total of above items	$4,727 36	$5,848 79
Meters in use end of year	4,514	4,873
Consumer expenses per meter per year	$1.047	$1.20
Consumer expenses per meter per month	$0.087	$0.10

The complaint in these proceedings does not justify an order by this commission establishing the proposed rates in all the territory supplied by the respondent. It is recommended, however, that the respondent establish the rate schedule set forth in the following order for all its consumers both in Appleton and in Neenah and Menasha.

It is Ordered, That the respondent in this case, the Wisconsin Traction, Light, Heat and Power Company, discontinue its present schedule of rates for gas service to consumers in Neenah, and place in effect, as a substitute therefor, the following rate schedule deemed just and reasonable, as provided under ch. 499, sec. 1797m-46, Laws of 1907.

For all gas service furnished for lighting, fuel, industrial or power purposes and passing through meter or meters owned and installed by the company, a charge of $1.15 net or $1.25 gross per M cubic feet for the first 5 M cubic feet used during any one month through any one meter. $1.00 net or $1.10 gross per M cubic feet for the next 15 M cubic feet used during the same month through the same meter. $0.90 net or $1.00 gross per M cubic feet for the next 30 M cubic feet used during the same month through the same meter. $0.75 net or $0.85 gross per M cubic feet for all gas used in excess of 50 M cubic feet used during the same month and passing through the same meter.

The minimum bill shall be graduated according to the size of meter and shall be as follows:

Size of meter.	Amount to be charged each month.	Size of meter.	Amount to be charged each month.
3 light	$0.25	45 light	$0.60
5 "	.25	60 "	1.00
10 "	.35	80 "	1.50
20 "	.35	100 "	2.00
30 "	.50	200 "	4.00

Where company is unable to read meter after reasonable effort, the fact should be plainly indicated upon the monthly bill, the minimum charge assessed and differences adjusted when the meter can be read.

Discount.

Company shall bill all consumers the gross rate, and the difference between the gross and net rates specified above, or 10 cts. per M cubic feet, shall constitute a discount for prompt payment.

Company's present regulations, that discount for prompt payment shall not be granted after the date set forth in the consumer's bill and as described thereon, is deemed reasonable.

Charge for the maintenance and replacement of illuminating burners and appliances or other charges for like services shall be reasonable and in accordance with schedules of charges filed with the Railroad Commission.

For the re-connection of meters for the same consumer upon the same premises, a charge of $1 is deemed reasonable.

CITY OF WEST ALLIS
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted March 21, 1911. Decided Aug. 7, 1911.

Petition for the closing of the grade crossing on National ave. in said city and substituting therefor a subway at another point. The petitioner and respondent had agreed upon the change prayed for. From the testimony submitted and investigations made by the Commission, it appears that the present crossing is unsafe and dangerous.

Ordered: **That respondent abolish its present grade crossing on National ave. and construct a new highway, diverting said National ave., with subway crossing.**

The petition represents that the petitioner is a duly incorporated city of the state of Wisconsin; that National avenue is a highway or street within the limits of said city and is crossed by the main tracks of the railway of the respondent at grade; that said National avenue at said point is at present a heavily traveled thoroughfare and that the travel upon the same is constantly increasing; that said respondent is now constructing a belt railroad around the city of Milwaukee, diverging from a point in its main line a short distance west of said National avenue, and that the large and extensive yards of said respondent are in process of construction and reached by said belt line; further, that it is the belief of the petitioner that it is the intention of said respondent to lay additional main tracks across said National avenue and that, upon the completion of said belt line and yards, the number of trains operated by said respondent across said street will be greatly increased, and that public safety requires an alteration in such crossing by the closing of the crossing at grade, and the substitution of another therefor not at grade, by the diversion of said National avenue from its present course to a course along the north line of said respondent's right of way to Wauwatosa avenue in said city and thence south under the tracks of said respondent to the northerly line of said National avenue.

Wherefore, petitioner prays that said grade crossing be closed, vacated and discontinued, and that a new street be laid with a subway crossing, both as heretofore described and as indicated on the plan attached to the petition.

In its answer the respondent admits the allegations of the petition.

The hearing was held at the city hall in West Allis on March 21, 1911. *F. C. Weed* appeared for the petitioner and *W. G. Wheeler* for the respondent.

The testimony shows that the petition was filed with the Commission upon the instigation of the respondent, who under date of Dec. 28, 1910, submitted a proposition to the city of West Allis agreeing to perform the work mentioned therein and outlining a plan of eliminating the present grade crossing by changing the course of National avenue, and constructing a subway at the place and in the manner set forth in the petition. Whereupon the common council of West Allis, under date of Jan. 17, 1911, passed a resolution authorizing the mayor and city clerk to petition this Commission for an order granting the desired mode and manner of crossing.

The plans of the railway company submitted at the hearing and the testimony of their witnesses show that it is contemplated to lay out a new street as a continuation of National avenue along the north line of the company's right of way, having a width of sixty-six feet and extending westward to Wauwatosa avenue, otherwise known as Seventy-seventh avenue, thence running southward, with a width of sixty feet along Seventy-seventh avenue until it intersects with National avenue on the south side of the railway tracks. A subway sixty feet in width now exists at said intersection; the railway company's plans provide an additional subway sixty feet wide east of and immediately adjoining the present structure, both subway passages being open to view but separately used for traffic. The assistant chief engineer stated that a belt line is being constructed from West Allis to connect with the main line at Lindwurm, and that all freight traffic not destined for Milwaukee will be taken around Milwaukee by such belt line, thus necessitating the passage of practically all freight trains over the crossing in question. He further stated that the increased freight traffic would require additional trackage over National avenue, making a double track for the present, and providing for three or four tracks for future developments.

All the witnesses for petitioner testified that the present crossing is dangerous to public travel and that increased danger would result from the laying of additional tracks at such point. It was conceded that the proposed subway would afford safe travel to the public from passing trains. Witnesses stated that National avenue is one of the main thoroughfares to Milwaukee and is extensively used by farmers, also that it is heavily traveled by automobiles and vehicles. Some witnesses expressed the belief that the proposed deviation of National avenue and the contemplated subway would make the intersection of Seventy-seventh and National avenues a more dangerous highway crossing than at present, by reason of the right angle turns of the streets, which prevent an extensive view of approaching vehicles and of the street cars that use Seventy-seventh avenue. It was claimed that a building owned by the railway company, standing on a lot at the northwest corner of such intersection, greatly obstructed the view when approaching from the west, and witnesses thought that such corner should be rounded off. Some objection was made to the angle at which the subway was planned, and also to the slightly rounded angle of the proposed street where it turns to go under the railroad, as being insufficient to give a good view of traffic approaching from the west. One of the witnesses suggested that an improvement would be effected by increasing the width of Seventy-seventh avenue thirty feet on each side instead of sixty feet entirely on the east side.

Subsequent to the hearing one of the engineering staff of the Commission examined the present crossing and investigated the changes contemplated by the railway company. On the basis of his report and from a review of the testimony it appears that the present grade crossing is unsafe and dangerous, and that public safety demands its elimination. The few objections made and the suggestions offered by witnesses relative to the increased highway danger at the subway crossing have been fully considered. We are of the opinion that a width of 120 feet at Seventy-seventh and National avenues, with the removal of the building at the northwest corner and the rounding off as much as possible of the embankment where the proposed highway turns into the subway, will adequately provide for safe highway traffic and give an adequate view of approaching vehicles and street cars. We believe that the plan submitted by the railroad company, which calls for changing the course of National avenue and the construction of a subway as above set forth, is the best mode of protection to public travel that can be devised under the conditions.

IT IS THEREFORE ORDERED, That the respondent, the Chicago and North Western Railway Company, abolish its present grade crossing on National avenue in the city of West Allis, and construct a new highway which shall divert said National avenue along the north line of respondent's right of way to Wauwatosa avenue, otherwise known as Seventy-seventh avenue, in said city, and thence south under the track of said respondent to the northerly line of said National avenue. The new highway and subway to be constructed according to plans to be submitted to the Commission for approval.

Six months is deemed a reasonable time within which to comply with this order.

IN RE APPLICATION OF THE OCONTO CITY WATER SUPPLY COMPANY FOR VALUATION OF ITS PROPERTY AND OTHER RELIEF.

Submitted Feb. 10, 1911. Decided Aug. 7, 1911.

Application for valuation of property and for order fixing rates. The history of the plant is given and the valuation, receipts and disbursements, going value, operating expenses, flat rate and meter systems, number and class of consumers and nature of fixtures used, the practice of charging for fire protection, are discussed. The value of the property is fixed at $125,000 and is apportioned, together with expenses and cost of furnishing service, between fire and commercial service. The normal operating expenses are fixed.

Held: 1. That the amounts spent in litigation, in the early history of the company, were not incurred in connection with the performance by the company of its service to the public and cannot be capitalized and treated as a part of the going value; that it would be an injustice to the consumers to compel them to pay dividends on money which had been spent without increasing, in any way, the value of the property, either in a physical sense or as a going concern.

2. That, in view of the facts that the failure of the plant to earn large dividends during the early years of operation appears to have been due to the establishment of the plant before the wants of the people made it necessary; that charges were made without reference either to the provisions of the franchise or the interests of the business; that no appreciable effort appears to have been made during this time to extend the business, only a small amount is allowed as going value. That to make a large allowance for going value, under the circumstances of this case, would be equivalent to capitalizing the losses incurred through careless and unprogressive management.

3. That, owing to the ease with which flowing wells may be obtained in Oconto, the company is engaged in a competitive business, and for the best interests of itself and the public must accept a return somewhat less than the cost of service, including depreciation and return on the investment.

4. That a water utility is furnishing two distinct classes of service, fire and general, and the fact that the general service cannot be made to pay a reasonable and fair return, should not cause the fire service to be burdened with a portion of the cost of general service.

5. That it is a function of the city to furnish adequate fire protection, and for furnishing fire protection a water utility is under obligations only to the city.

6. That the cost of furnishing fire protection bears little relation to the number of hydrants; that the demand upon the station is practically independent of the number of hydrants, but is determined by the fire risks, which demand is expressed

in terms of fire streams of a certain diameter and pressure; that a charge should be made against the city only to meet the cost occasioned by the fire demand of the city as a whole, and there should be no charge for private hydrant fire protection; that a charge for sprinkler systems is in accord with the cost of service principle.

7. Flat rates and meter rates are fixed and company ordered to install meters in certain cases, and consumers are given the right to install meters at their own expense.

The applicant in this case, the Oconto City Water Supply Company, is a corporation duly organized and engaged in the business of supplying water for public and private purposes in the city of Oconto, Wis. The original petition was filed Nov. 13, 1908, and since that date supplemental petitions have been filed, praying for relief of a temporary character, pending the final decision of the Commission. The matters involved in these supplemental petitions have been covered by two orders issued by the Commission. The first of these was issued on Feb. 28, 1910, and provided:

"That for service furnished by said Oconto City Water Supply Company to its private consumers in the city of Oconto since Jan. 1, 1909, such consumers shall, until the further order of this Commission, pay, and the said Oconto City Water Supply Company shall receive, on account, on the bills heretofore rendered for service since Jan. 1, 1909, and which may be hereafter rendered until the further order of the Commission, such sum, rate, or charge as was heretofore charged and exacted by said Oconto City Water Supply Company of and from such private consumers, respectively, prior to the first day of January, 1909.

"That the rates finally fixed by this Commission shall apply to the service rendered to said private consumers from Jan. 1, 1909, up to the date of such determination, and that if under such decision the amount paid by the consumer shall be more than what he should have paid, reckoned upon the rate as so to be fixed, said Oconto City Water Supply Company shall adjust such difference and reimburse each private consumer either by return of the excess in cash or by water service to be rendered, and that if the amount so paid by any consumer shall be less than what he should have paid as reckoned by said rates so to be fixed by this Commission, each such consumer shall pay to said Oconto City Water Supply Company such difference."

Owing to the fact that some difficulty was encountered by the applicant in collecting the revenue under the above order, a further order was issued by the Commission, under date of Oct. 3, 1910, as follows (5 W. R. C. R. 691, 694):

"That for service furnished by said Oconto City Water Supply Company to its private consumers in the city of Oconto since Jan. 1, 1909, such consumers shall, until the further order of this Commission, pay, and the said Oconto City Water Supply Company shall receive, on account, on the bills heretofore rendered for service since Jan. 1, 1909, and which may hereafter be rendered until the further order of this Commission, such sum, rate or charge for water service as was charged and exacted by said Oconto City Water Supply Company of and from such private consumers, respectively, prior to Jan. 1, 1909, without prejudice to the rights of the consumer so paying or the said utility in so receiving such sum.

"That consumers of said utility now delinquent may pay either under the above order or under said order of Feb. 28, 1910, which is continued in force.

"That in case of neglect, failure or refusal of any consumer of said utility to pay either in pursuance of this order or said order of Feb. 28, 1910, said Oconto City Water Supply Company shall have the right, in its discretion, after thirty days notice to such delinquent consumer, to cut off his water supply."

The effects of these orders are thus two in number: 1. To furnish the applicant a basis for making its charges, pending the final order of the Commission; and 2. to make the rates established by this decision the legal rates after Jan. 1, 1909, instead of the rates prescribed by the franchise.

There are therefore two matters to be settled by this decision: A value must be fixed upon the property of the applicant, and the rates which shall be charged must be fixed.

Hearings on this case were held on Feb. 28, 1910, Sep. 20, 1910, and Feb. 10, 1911. Appearances were as follows: For the applicant, *Greene, Fairchild, North & Parker,* by *Mr. North;* for the city of Oconto, *James J. Gill* and *V. J. O'Kelliher* at the hearing of Feb. 28, 1910; *Mr. Gill, Mr. O'Kelliher,* and *P. H. Lynch* at the hearing on Sep. 20, 1910, and at the hearing of Feb. 10, 1911, *Mr. Gill.*

The history of the plant of the Oconto City Water Supply Company dates from July 9, 1890. On that date the city council of Oconto passed an ordinance known as ordinance No. 153, providing for a supply of water to the city of Oconto and its inhabitants and authorizing the Oconto Water Company, its successors and assigns, to construct, operate and maintain a water works system. Acting under the provisions of this ordinance the Oconto Water Company proceeded to contruct a plant. The construction was completed and the plant put in operation in September, 1891. On Oct. 12, 1892, Albert E. Smith, a receiver appointed by the United States circuit court for the Eastern district of Wisconsin, took charge of the plant, and it remained in his charge until July 15, 1894, at which time it was taken over by the Oconto Water Supply Company, by whom it has since been operated.

The franchise granted by the ordinance of July 9, 1890, was to continue for thirty years, but on Dec. 6, 1909, the water company surrendered its franchise and took an indeterminate permit in accordance with the provisions of the law relating to such permits.

According to the franchise under which the applicant operated its plant until Dec. 6, 1909, the rates for water service were to be as follows:

‘‘Connections between the main and the consumer shall be made at the expense of the consumer, and the lowest annual rate to any one consumer in any one case shall be $5.

ANNUAL WATER RATES.

Banks, one self-closing faucet	$8.00
Bakery, each oven	$15 to $30.00
Barber shop, each chair	4.00
Bath, private	4.00
Bath, in boarding house or hotel	8.00
Bath, public, not less than	8.00
Brewery	Special
Billiard saloon, each table	4.00
Boarding house, per room (no license less than $10)	1.50
Book-bindery, not less than	10.00
Brick work, per thousand laid	.10
Blacksmith shop, each forge	3.00
Brick yard	Special
Butcher shop, steam extra	15.00
Candy manufactory	$15 to $30.00
Cigar manufactory (no license less than $10), per hand	2.00
Confectioners	$10 to $30.00
Cows, each	2.00
Distillery	Special
Dyeing and scouring	$10 to $30.00
Fountains, 1-16 in. orifice, per season	8.00
Fountains, larger orifice	Special
Fountains to be used not more than 6 hours per day, for the season of 6 months.	
Halls and lodges	$10.00 to $20.00
Horse, one, including washing carriage	4.00
Horse, each additional	2.00
Hotel	Special
Ice cream saloons	$10.00 to $20.00
Laundries	Special
Offices	$5.00 to $8.00
Printing offices, 6 hands or less, steam extra	10.00
Photograph gallery	$10.00 to 20.00
Plastering, per 100 sq. yds.	.25

Residence occupied by one family, for domestic use, one to five rooms	5.00
Each additional room	1.00
Restaurants	$12.00 to $30.00
Saloons	$12.00 to $30.00
Sprinkling lawns with ⅛ in. orifice, not more than 4 hours per day, 200 sq. yds. or less, per sq. yd. per season	2½ cts.
Next 300 yds., per sq. yd.	1½ cts.
All over 500 yds. per sq. yd.	1 ct.
Sprinkling carts, public	Special
Steam boilers	Special
Sprinkling sidewalk to center of street, ⅛ in. nozzle, no license less than $5, per front foot per season	10 cts.
Stable, livery, sale or boarding, six horses or less, including carriage washing	$15.00
Each additional horse	1.50
Stone work, per perch	7 cts.
Storage and shops	Special
Theaters	Special
Urinals, in private houses, self closing, each	$3.00
Urinals, in stores, banks, offices and saloons, self-closing, each	5.00
Water closets, private, first	5.00
Each additional	3.00
Water closets, public	Special

METER RATES.

Use per day.	Per 100 gals.
100 to 500 gals.	5 cts.
500 to 1,500 gals.	4 cts.
1,500 to 3,000 gals.	3⅓ cts.
3,000 to 5,000 gals.	3 cts.
5,000 to 10,000 gals.	2½ cts.
10,000 or more gals	2 cts.

All supplies not enumerated, subject to special rates."

The ordinance further provided that a pressure of 40 lbs. to the square inch was to be maintained for domestic service, but both parties in this case have agreed that 30 lbs. to the square inch is an adequate pressure, and such pressure has been maintained for some time past. The fire tests prescribed by the franchise were as follows:

> "From eight separate hydrants, one-half selected by the committee, and one-half selected by the grantees and located in the business or manufacturing part of the city, at one and the same time (the water works) shall throw from each of said hydrants through 100 ft. of 2½ in. smooth rubber hose and an inch ring nozzle a stream of water 100 ft. vertically, or one 130 feet horizontally, in still air * * *. The machinery and distribution pipe system are to be tested to an hydraulic pressure of 150 lbs. per sq. in."

The city was to pay $6,500 per year for hydrants set on the original pipe system, to be not less than 80 nor more than 100 in number, $50 per year for each hydrant which it should order placed on extensions, except that if 10 or more hydrants were ordered and located at one time the rate per hydrant should be $45 per year.

All water used for public buildings, fountains, and for flushing sewers and gutters should be furnished free to the city, subject to the restrictions that no more than two hydrants should be opened at any one time for flushing purposes, and no hydrant should be opened oftener than twice a week, or longer than twenty minutes at one time, and that no flushing should be done during time of fire. The total cost to the city of the service given amounts at present to $7,550 per year.

The first step to be taken in determining the amounts to be paid by the public and by private consumers is to determine the valuation of the property. Aside from the valuation made by the engineering staff of the Commission, the facts relating to the value of the property are not given with sufficient accuracy to admit of careful checking. The company is capitalized at $100,000, all in common stock, which appears to be considerably lower than the actual value of the property. The following table shows the balance sheets as reported by the company in its annual reports to the Commission:

	Year ending Dec. 31, 1907.	Year ending Jun. 30, 1909	Year ending Jun. 30, 1910.
ASSETS.			
Plant investment	$100,000 00	$111,189 19	$121,525 52
Construction during year	6,021 02	10,336 33	1,489 40
Cash	....	258 91	179 16
Accounts receivable	....	9,762 52	12,367 00
Miscellaneous stock	....	....	125 84
Total assets	$106,021 02	$131,546 95	$135,686 92
LIABILITIES.			
Capital stock,—common	$100,000 00	$100,000 00	$100,000 00
Depreciation reserve fund	....	5 25	6 80
Notes and bills payable	....	16,100 00	17,100 00
Accounts payable	....	2,677 50	6,236 66
Open accounts	....	15 83	3,593 93
Surplus	6,021 02	12,748 37	8,749 53
Total liabilities	$106,021 02	$131,546 95	$135,686 92

An examination of the balance sheets shows that for the year 1907 the amount of stock issued and outstanding was entered as the value of the plant at the beginning of the year. By the end of 1909 the value carried on the books of the company corresponds very closely to the informal valuation made by the staff. The total value of the plant at the end of the fiscal year 1909-1910, as shown in the balance sheet, is $123,014.92. This amount does not help very much in arriving at the valuation of the property for purposes of this case, as there is nothing to indicate on what basis the value of $111,189.19 for the beginning of the fiscal year 1908-1909 is made up. As the plant value was carried on the books for the year ending Dec. 31, 1907, at $106,021.02, there is thus an amount of $5,168.17 unaccounted for as an increase in value from Dec. 1, 1907, to July 1, 1908. In the report submitted by the company, covering its operations from Aug. 1, 1894, to June 30, 1908, no construction is reported during the six months in question. The plant value reported for the beginning of 1907 is simply the par value of outstanding securities, however, and consequently is not an accurate index of actual value. The values reported for the other two years appear to represent an adjustment of property values in an attempt to arrive at the actual value, but cannot be accepted as a final indication of value.

The disbursements for construction and equipment, as reported by the company, are shown in the summary of the financial operations of the company from Aug. 1, 1894, to June 30, 1908. This does not cover the period in which the property was operated by the Oconto Water Company, nor the time that it was in the receiver's hands. There are no records available of the business of the Oconto Water Company, and the report of the receiver does not show the expenditures for construction separately from expense of operation. Undoubtedly the amount expended for construction and equipment during this time was considerable, as the receiver's report shows that he had extended the plant by adding 3,200 feet of cast iron pipe, 1,074 feet of sub-mains, and 8 hydrants, and that a new artesian well was built, and a number of minor improvements made. Following is the summary covering the period from Aug. 1, 1894, to June 30, 1908:

SUMMARY OF THE DISBURSEMENTS

OF THE OCONTO CITY WATER SUPPLY COMPANY.

Year.	Construction and equipment.	Pumping expense.	Distribution expense.	Undistributed expenses.	General expense.	Dividends.
1894....	....	$57 56	....	$1,284 61	$2,081 65	....
1895....	$478 64	2,915 17	....	273 28	4,994 36	$3,000 00
1896....	....	2,267 39	....	117 28	5,013 75	4,000 00
1897....	16 00	2,217 14	....	94 53	5,090 97	....
1898....	1,480 34	2,455 78	$184 05	80 59	7,610 66	....
1899....	914 90	2,669 61	10 25	181 84	4,497 18	....
1900....	490 48	3,376 89	....	607 93	4,714 13	....
1901....	298 56	2,899 49	....	373 01	4,034 86	5,000 00
1902....	2,909 93	3,205 17	4 90	690 28	3,284 23	2,000 00
1903....	189 96	2,543 42	....	654 14	3,107 22	6,500 00
1904....	839 75	2,908 04	58 63	740 01	2,922 30	6,500 00
1905....	526 22	2,574 19	....	733 10	2,754 25	6,000 00
1906....	69 95	3,319 75	120 36	924 57	2,703 41	5,500 00
1907....	6,077 40	6,094 20	....	772 66	3,037 95	5,000 00
1908....	....	2,739 34	158 24	9 54	477 12	....
Total.	$14,292 13	$42,243 14	$536 43	$7,537 47	$56,354 04	$43,500 00

During the years covered by this report it appears to have been the policy of the company to make extensions and additions to the plant out of the earnings of the business. The balance sheet for the end of the year 1907 shows no liabilities with the exception of the $100,000 of capital stock and $6,021.02 of surplus represented by the amount of construction carried on during the year. There have been no bonds issued, and as there was no floating debt at the end of 1907, there seems to be no doubt that funds needed to add to the plant were taken from earnings. Since 1907 earnings appear to have been insufficient to provide for extensions. This has been partly due to the loss of consumers, and partly to the failure of a large number of consumers to make payment for service. The floating debt, however, has not been entirely incurred to provide funds for extensions and additions. Part of it was incurred because of greatly increased expenses of operation for which money had to be obtained, and in the absence of sufficient receipts from consumers, the incurring of a debt, either floating or bonded, appears to have been necessary. Construction during the fiscal years ending June 30, 1909, and June 30, 1910, amounted to $11,846.52. On June 30, 1910, "Accounts receivable" amounted to $12,367.00 and what might be classed as "Floating debt" to $26,929.59, an excess over "Accounts receivable" of $14,562.-59. That is, nearly $3,000 of floating debt was contracted in excess of the amount that would have been needed to provide for new construction, if all consumers had paid their bills promptly. From this it is evident that such construction as took place during the two fiscal years in question could not have been provided for out of earnings. Only $2,000 dividends were paid during the year 1908-1909, and none at all during the next year. The net receipts which would have been obtained if all bills had been paid as charged during these two years, exclusive of any provision for interest or depreciation, amounted to $7,237.86, showing that it would have been impracticable to provide for construction out of earnings, even if all earnings could have been collected and no dividends had been paid.

The engineering staff estimates the value of extensions made during the receivership at $4,500. At the time the receiver took charge of the plant $25 was all the money on hand. When the receivership was terminated $3,000 was reserved in the hands of the receiver under order of court, and $10,347.22 was paid over to the Oconto City Water Supply Company. What disposition was eventually made of the $3,000 reserve does not appear, but it seems certain that it must have been turned over to the Oconto City Water Supply Company after allowance was made for receiver's fees, etc. In addition, $1,124.30 of floating indebtedness was paid during the receivership.

The construction and the floating debt paid during the time of the receivership, as well as the construction up to June 30, 1908, was provided for out of earnings. $10,322.22 in excess of cash on hand Oct. 12, 1892, was turned over to the Oconto City Water Supply Company at the termination of the receivership. Instead of the $43,500, which was paid out in the form of dividends representing the entire return on the property from 1892 to 1898, the total return is made up as follows:

$43,500.00	Dividends.
14,292.13	Construction, 1894–1908. Paid out of earnings.
4,500.00	Construction, 1892–1894. Paid out of earnings.
10,322.22	Net amount paid by receiver to Oconto City Water Supply Co.
1,124.30	Floating debt paid by receiver out of earnings.
$73,738.65	Net return on investment.

It has not been possible to determine what disposition was made of the $10,322.22 which was the amount turned over to the Oconto City Water Supply Company, less $25 which was on hand at the beginning of the receivership, and it may be that this should not be listed as a return upon the investment. Very little was done in the way of construction for several years after 1894. If this money was used for new construction, for dividends, or for operating expenses, it would appear either in the $43,500 of dividends or the $14,292.13 of construction, and should not be counted twice. If this is excluded, the total amounts to $63,416.43, aside from the $3,000 which was reserved in the hands of the receiver.

The following table shows the receipts and disbursements from Aug. 1, 1894, to June 30, 1908:

Notes payable		$2,000.00
Sundry accounts payable		848.73
Cash	$53.09	
Bank	719.28	
Pumping station equipment	343.44	
Transmission mains	6,474.21	
Distribution meters	211.20	
Sources of water supply—wells	3,284.06	
Earnings from commercial sales		75,895.25
Municipal hydrant rentals		90,593.29
Street sprinkling		918.17
Sundries		124.70
Insurance received		1,096.72
Operating labor, pumping	6,618.44	
Pumping station supplies and expenses	1,602.11	
Maintenance of pumping station equipment	85.75	
Maintenance of pumping station buildings, etc.	595.92	
Operating labor, steam generation	13,236.87	
Fuel for steam	19,336.71	
Maint. of boiler plant equipment	767.34	
" " trans. mains and storage facilities	271.12	
" " services	66.11	
" " meters	4.90	
" " distribution mains	194.30	
General office salaries	5,566.66	
" " supplies and expenses	1,373.28	
" law expenses	12,512.20	
" miscellaneous expense	6,518.61	
Insurance	680.61	
Stationery and printing	194.65	
Taxes	28,900.85	
Interest on floating debt	607.18	
Construction, miscellaneous	285.48	
Machinery account	2,213.40	
Miscellaneous labor	1,868.78	
Building account, miscellaneous	1,480.34	
Freight, express and cartage	312.53	
Miscellaneous expense	5,356.16	
Dividends paid	43,500.00	
Adjustment account	6,241.28	
	$171,476.86	$171,476.86

The next table shows the results of a comparison of receipts and expenditures for each year from 1894 to 1909.

Year.	Receipts.	Operating expenses.	Operating expenses excluding general law expenses.	Net receipts excluding general law expenses.
1894*	$5,202 19	$3.423 82	$3,423 82	$1,778 37
1895	11,404 85	8,182 81	6,434 51	4,970 34
1896	8,184 37	7,398 52	5,409 47	2,774 90
1897	14.920 99	7,402 64	7,057 66	7,863 33
1898	6,387 38	10,361 08	5,623 07	764 31
1899	6,407 65	7,358 88	5,816 82	560 83
1900	15.219 81	8,698 95	7,440 98	7,778 83
1901	12.268 59	7,307 36	6,555 17	5,713 42
1902	16,230 16	7,184 58	7,018 91	9,211 25
1903	13.062 24	6,304 78	6,304 78	6,757 46
1904	13.030 28	6,628 98	6.625 11	6,405 17
1905	13.632 68	6,061 54	6.061 54	7,571 14
1906	14.032 81	7,068 09	7.068 09	6,964 72
1907	14,463 45	9,904 81	9,904 81	4,558 64
1908	14,708 04	12.412 28	12,188 08	2,519 96
Total	....	....	....	$76,192 67

*Five months only.

This table includes six months of 1908 which are not included in the preceding computation of amount of return. It seems, too, that a portion of the revenues shown in the above table were never collected, that is, the statement of revenues given above includes all revenues as charged, even if they were not all collected. The statement of total receipts and disbursements for the period includes $6,241.28 under the head of "Adjustment accounts," which is intended to make provision for uncollectible accounts. The net receipts shown in the table above are not the actual amounts available for return on the investment, but the amounts which would have been available if all bills had been collected and there had been no general law expense.

Counsel for the respondent argued that the amount spent for litigation, especially during the earlier years of the operation of the utility, should not be considered an operating expense. It was pointed out on behalf of the respondent that the greatest part of the general law expenses, which for the entire period listed above amount to $12,736.30, were incurred in the course of litigation in which the National Foundry and Pipe Works, Limited, sought to secure a lien upon the property of the water company, because of the failure of the water company to pay for pipe which was installed in its system, and the respondent argued that such expenses could not be considered operating expenses. The applicant has agreed that the expenses were incurred as stated, but has not taken any decisive stand regarding the manner in which such expenses should be treated in this case.

It seems perfectly clear that these expenses were not incurred by the company in connection with the performance of its service to the public, and that the furnishing of water would have gone on even if no such expenses had been occasioned. Therefore, it seems only just to exclude these expenses, or rather such portion of general law expenses as were not incurred in connection with the performance of the public function of the utility, from operating expenses when it is determined what the returns on the investment have been.

This, of course, raises the question of what consideration should be given to such expenses if they are not to be regarded as operating expenses. On this point the attorneys for both parties have refrained from making any argument. It seems to have been agreed, however, that, as a result of the litigation, a large amount of pipe laid in the trenches of the applicant was not paid for. The legal expense, therefore, amounted to an expense to defend title to the property. The value of the property was not enhanced because of the cost of litigation. In reality, the money spent for litigation amounted to an expense for securing the property, and from the standpoint of the applicant, at least, constituted a payment for this property, since its title to the mains and pipes in question was cleared as a result of the proceedings. The actual value of the property was not affected at all by the legal procedure. Neither does it seem that this legal expense should be capitalized and treated as a part of the going value of the concern. If this were to be treated as a going value, on the ground that it was an expense of establishing the business, it would seem only fair to deduct from the value of the plant such portion of the cost of building as the utility was released from paying, as a result of the litigation in question, for by the same process of reasoning it can be held that the cost of the plant and of building up the business was decreased by the amount from payment of which the company was released. It would seem to be more equitable to consider that neither of these two factors affects the going value. The fact that a portion of the property was obtained without cost to the applicant, does not lessen the value of the plant for the purposes for which it was intended, and it may be said, with equal justice, that the legal expense of defending the title did not increase the value.

There appears to be a distinction between expenses incident to building up a business, which, as previous decisions of this Commission have held, add an element of going value to the property, by the very fact that they have been incurred directly in connection with extending the business, and expenses, such as the cost of the litigation in question, which might have been expanded indefinitely without adding one consumer to the list or increasing the sales of water a single gallon. Even if the case had been decided against the water company, it does not follow that the legal expenses should be capitalized, for it would be an injustice to the customers of the company to compel them to pay dividends on money which had been spent without increasing, in any way, the value of the property, either in a physical sense or as a going concern. The addition of going value to physical value rests for its justification upon the theory that owners should have a return upon the cost of developing the business. It does not follow, however, that the owner should have, or that the consumer should pay, a return upon money which has been expended in order to avoid, or to attempt to avoid, paying for part of the physical equipment of the plant. Certainly neither the property nor the consumer would benefit from such litigation, and its cost should not be made a burden upon the plant and so, indirectly, upon the consumer.

If, then, we exclude from operating expenses approximately $12,000, which seems to have been the amount expended on the litigation in question, we find the excess of operating revenues over operating expenses from Aug. 1, 1894, to Dec. 31, 1908, to be about $75,500. Adding to this the $10,322.22 turned over to the Oconto City Water Supply Company by the receiver, in excess of cash on hand when the receiver took charge, the $1,124.30 of floating debt paid by the receiver, and about $4,500 for construction during the receivership, which was paid out of earnings, we find the total amount available for return on investment from Oct. 12, 1892, to Dec. 31, 1908, to be about $91,446. From this should be deducted an amount to provide for the difference between earnings as listed on the books of the company and money actually collected. How much this amount is, can not be stated exactly, but probably $90,000 will represent rather closely the amount available for return after allowance is made for this deduction. This covers a period of almost 16¼ years, and upon the capitalization of $100,000 would yield an average return of very nearly 5.4 per cent. The fact that only $43,500 of dividends has been paid and about $20,000 of construction and floating debt, does not alter the fact that the excess of revenues over expenses has been sufficient to yield about 5.4 per cent on the capital stock. The actual average value of the property during this period has been considerably above $100,000, so that the rate of available return does not seem to have averaged more than 5 per cent during these 16¼ years. These figures assume that $12,000 of the amount of general law expenses should be treated as available for interest or depreciation on the investment.

This brings up the question of how much, if any, should be added to the physicial value of the plant as going value. The informal valuation in this case, which was allowed to stand as the tentative valuation until the hearings and the arguments were completed, was of date June 30, 1909, and the values were as listed in the following table:

TENTATIVE VALUATION OF PHYSICAL PROPERTY.

June 30, 1909.

Classification.	New.	Existing.
1. Land..	$2,030	$2,030
2. Wells, intakes and suctions	10,727	10,561
3. Reservoir	6,145	6,012
4. Distribution system	67,021	65,239
5. Pumping plant equipment	10,385	5.969
6. Buildings and miscellaneous structures	7,933	6.520
7. Office furniture and appliances	265	212
8. Tools and implements	258	129
9. Horses, wagons and miscellaneous	....	....
Total items 1–9	$104.764	$96.672
10. Add 12% (see note below)	12.572	11.601
11. Stores and supplies	2.602	2,602
12. Paving	215	211
13. Non-operating property	141	41
Total items 1–13	$120,294	$111.127

NOTE:—12% to cover engineering, interest during construction, contingencies, etc.

Objections to this valuation were entered by both parties. It does not seem necessary to take up these objections in detail at this point. They have been thoroughly investigated by the engineering staff and revisions made in cases where the facts as ascertained bore out the objections. Objections of the applicant related principally to the cost of river crossings and the present value fixed on pumps and boilers. Respondent objected to allowance made by the staff for a number of mains, on the ground that the mains in question were not owned by the applicant. These objections have been, in general, sustained by the investigations made by the staff, as have also a number of objections relating to the weight of pipes and specials. The valuation has also been brought down to date.

The construction reported by the company for the year ending June 30, 1910, amounted to $1,489.40. Since that date a house has been purchased for use as an office; a deep well pump has been added to the property, which is listed in the revised valuation under the head of non-operating property; well number 6 has been completed, and a number of smaller additions made. These increases, taken in connection with the revisions of the informal valuation, result in the final valuation of the physical property shown below:

FINAL VALUATION OF PHYSICAL PROPERTY.

	Classification.	New.	Existing.
1.	Land	$2,530	$2,530
2.	Wells, intakes and suctions	13,859	13,781
3.	Reservoirs and standpipes	6,626	6,474
4.	Distribution system	66,017	64,366
5.	Pumping plant equipment	10,461	5,335
6.	Buildings and miscellaneous structures	8,985	7,327
7.	Office furniture and appliances	674	539
8.	Tools and instruments	300	150
9.	Horses, wagons and miscellaneous	....	....
	Total items 1-9	$109,432	$100,502
10.	Add 12% (see note below)	13,132	12,061
11.	Stores and supplies	2,550	2,550
12.	Paving	....	....
13.	Non-operating property	4,534	2,934
	Total items 1-13	$129,648	$118,047

NOTE:—12% to cover engineering, interest during construction, contingencies, etc.

This valuation includes a well drilling outfit, under the head of non-operating property, which is valued at $3,000 new, and at $1,500 in its present condition. Counsel for the respondent argued that this outfit does not constitute a part of the property used and useful for the purpose of supplying water, and in this view the applicant acquiesced. In arriving at the value of the wells, an allowance has been made to cover use of drilling apparatus. The well drilling outfit is not property which is useful for supplying water. When engaged in drilling a well, the applicant takes the place of a contractor and it seems that the well drilling outfit, at least from the standpoint of the customers of the water company, should be treated, in fixing the value of the property, as if it were owned by an outside party. This deduction would make the cost of reproduction new $126,648, and its value in present condition $116,547.

Counsel for the applicant argued that an addition should be made to the physical value of the plant to cover the intangible elements. In this argument he assumed that the revised valuation of physical property would amount to about $122,000, and maintained that 10 per cent in addition to this amount should be allowed for going value, making the total value of the property $134,200. Going value, however, is an element which depends upon the circumstances in each case, and cannot be determined arbitrarily. The addition of an amount to cover going value depends upon the condition of the business and not upon a rule which would give to all concerns a going value, regardless of their financial situation.

On behalf of the respondent it was argued that if an addition were made for going value, such addition should be made to the present value of the property and not to the cost new, and that the condition of the plant during the earlier years of its operation was so prosperous that no allowance whatever need be made for going value. The examination which we have made of the financial condition of the applicant shows that from 1892 to 1908 an amount was earned sufficient to yield an average return, in some form or other, of about 5 per cent upon the value of the property.

The business of the Oconto City Water Supply Company appears to have developed rather slowly. In fact, it may be doubted whether there was an actual necessity for the service of the applicant, other than for fire protection, for a number of years after the installation of the plant. The earliest figures available regarding the number of commercial and industrial users of water are for the first quarter of 1892, at which time these users numbered 136. The following table shows the number of consumers for each year since that time, with the exception of 1902:

Year.	No. of consumers.
1892	265
1893	348
1894	375
1895	394
1896	441
1897	417
1898	440
1899	459
1900	494
1901	517
1902	....
1903	558
1904	627
1905	666
1906	679
1907	820
1908	759
1909	777
1910	718

For the year 1907 the 820 consumers reported refers to the total number of commercial and industrial service connections, whether actually in use or not, and the numbers reported for other years are the active consumers. The total number of active consumers at the end of 1907 seems to have been, however, considerably above the number for the previous year and above the number for any year since. The development of the commercial and industrial side of the business appears to have been slow, substantiating the statement that the community did not need the utility, except for fire protection, at the time it was put in. Every water plant naturally goes through a period of development, during which people come to appreciate the advantages of being supplied with water under pressure, but in the case of the water company in Oconto this period has been unusually prolonged. In a case of this kind it is a question how much of the losses during the developmental period should be considered as adding an element of going value to the property.

For example, if a utility is established in a city far in advance of the needs of the community, the losses during the early years of its operation may be very great, so much so that to consider these losses as adding to the going value of the utility would make the apparent value out of all proportion to the physical value. In the case of Oconto, the population has been relatively constant during the past twenty years, and up to about 1904 the saturation point had been nowhere nearly reached. Furthermore, it appears that up to the end of 1908 the charges for water were not made either in accordance with the franchise or with any principle that we are able to discover, except the principle of attempting to charge as much as the business would bear. If, then, the revenues during fourteen or fifteen years of operation were insufficient to provide for depreciation and a reasonable return on investment, it does not seem to be just to present consumers to add all these losses to the physical value. There is admitted to be a speculative element in the water supply business, and in this case it appears that the development of the business did not fulfill the expectation of the promoters. If the community was in need of the utility for commercial and industrial water supply, the losses during the developmental period, assuming that the management was economical and efficient, would in reality form a part of the investment. If this situation does not hold, it is easy to conceive of a condition where the losses, added to the physical value, would soon reach such an extent that it would be impossible ever to earn dividends on such a valuation.

The management of the company seems to have been economical during the developmental period. Expenses were low, salaries were small, and every attempt seems to have been made to keep the cost of operation down to a reasonable point, so that, as far as operating expenses are concerned, there is nothing to indicate that allowance should not be made for going value.

In view of all these facts, it seems that some allowance should be made for going value, but not as much as a cursory examination of revenues and expenses would seem to indicate. In his argument against the allowance of any element of going value, counsel for the respondent appears to have confused the term "going value" with the term "good will," stating that in ordinary business a merchant would not add to his investment upon which to reckon profits the value of the good will of the business. Possibly this may be true, but it does not follow that a merchant would not consider the cost of building up his business as a part of the investment, which is exactly what is done when allowance is made for going value in the case of a public utility.

Counsel for the respondent cited a number of cases in support of his argument that going value ought not to be allowed in the case of a water utility, but owing to the confusion of the terms "good will" and "going value" his argument really is that nothing should be added to the valuation because of the good will of the business, and not that the cost of development of the business should not be considered as a part of the valuation or of the investment in the business.

Whether going value should constitute an addition to the cost new of the property, or to the value in its present condition, is a matter which must be decided largely on the circumstances in each individual case, or, rather, cost of reproduction new, physical value in present condition, original investment, and going value are all elements to be considered in ascertaining the actual value of the property. In this case, the testimony shows that the cost of the original system was about $107,000. There is no record of additions or extensions up to the time of the receivership, but during the time of the receivership the cost of construction and equipment has been estimated at $4,500. From August, 1894, to June 30, 1908, the disbursements for construction and equipment were $14,292.13, and for the fiscal years ending June 30, 1909, and June 30, 1910, the expenditure for construction, as shown by the reports to the Commission, were $10,357.12 and $1,489.40, respectively, including, however, the cost of the well drilling outfit. Since June 30, 1910, the construction and additions have amounted to about $4,000. Deducting 2,200, approximately the price paid for the well drilling outfit, we are able to account for an investment of about $139,400.

With regard to the investment in the original plant, the attention of the Commission was called to a transcript of the record in the United States court of appeals, Seventh circuit, in the course of litigation between the Oconto City Water Supply Company and the National Foundry and Pipe Works, Limited. The deposition of S. D. Andrews, one of the owners of the original plant, was taken on Oct. 1, 1891, a few days after the completion of the plant. In it he states that the cost of the plant, up to that date, had been very nearly $107,000 but added that he would not want to pay as much as $100,000 for the property. T. W. Gray, who has been engaged in an advisory capacity at various times by the Oconto City Water Supply Company and had charge of laying the pipe in the original system at Oconto, testified at the hearing of Feb. 28, 1910, that he had estimated the cost of the original system at an amount between $95,000 and $100,000, but that it was possible that the cost might have been as high as $107,000.

We have, then, to consider the investment of about $139,400, the cost of reproduction new of $126,648, and the value in present condition of $116,547, as well as the intangible elements entering into value, in fixing a valuation for rate-making purposes. In view of the fact that the failure of the plant to earn large dividends during the early years of operation appears to have been due to the fact that it was established before the wants of the community made it necessary, that charges for water seem to have been made in a slipshod manner, without reference either to the provisions of the franchise or the interests of the business, and the further fact that no appreciable effort appears to have been made during this time to extend the business, it seems that only a small amount can be allowed as going value because of the cost of building up the business. To make a large allowance for going value, under the circumstances in this case, would be equivalent to capitalizing the losses incurred through careless and unprogressive management.

In the case of *Hill et al. v. Antigo Water Co.* 1909, 3 W. R. C. R. 623, 725, this Commission said:

> "In fixing rates for public utilities consideration should be given to extraordinary efforts on the part of the management in extending the use of the services of the plants. Such extensions subserve the best interests of both the plants and their customers, and when due to initiative and enterprise on the part of the management an allowance should be made for it in the way of extra profits. Such enterprise is of the nature of good will, but it is so fluctuating and uncertain that it should not be capitalized. It is a matter, however, that should receive due consideration in rate making, for it constitutes the main incentive to efficient management. In the long run low rates are more dependent upon the extension of the business and good management than upon anything else. To encourage such extension and such management, therefore, is in line with sound practice."

If rapid extension of the business and efficient management are to justify higher rates, it cannot be that the opposite condition of affairs can also justify higher rates, either directly or through the addition of a going value, and if the rapid extension and efficient management cannot be capitalized, it does not seem just to capitalize the results of a stationary condition of the business and of poor management. In other words, if losses are due to such causes as these, during the period in which the business should normally be developing, it is not fair to the customers of the utility to add these losses to the physical valuation under the name of going value. The cost of building up the business, or the "cost of going value," ought to be clearly distinguished from the cost of unprogressive management. The greatest difficulty, of course, is to make such a distinction and to reduce it to terms of dollars and cents. It is not possible to make a mathematically accurate separation of these two items of expense, but from the facts in this case it seems that a large part of the losses during the first years of operation was due to managerial oversights or inefficiency, and such part should not be made in any form a charge against the consumer.

No provision has been made by the applicant to cover depreciation, and the total amount available for some form of return upon investment has been sufficient to yield a return of only about 5 per cent on the value of the property. The exact amount which should be allowed for going value, and the final valuation to be arrived at, may be matters of dispute if an attempt is made to fix a value other than in round numbers. In view of all the facts as presented, however, it appears that the company should be allowed to base its returns upon a valuation of about $125,000. Although this is somewhat less than the cost of reproduction new, and considerably below the amount which appears to have been invested in the property, it is sufficiently in excess of the present value of the physical property to make adequate provision for going value, at the same time it is the lowest figure which seems just to the utility, and as high a valuation as the public should be expected to pay returns upon.

Before attempting to determine what the normal and proper operating expenses of the applicant amount to, it will be necessary briefly to review the history of the utility and call attention to the conditions from which this dispute arose. Up to Jan. 1, 1909, bills for water furnished by the applicant had not been rendered strictly in accordance with the franchise rates. In a great many cases it seems to have been true that those in charge of the water plant did not know what fixtures consumers had connected. Bills were not rendered, in many cases, according to the number or character of fixtures, but were made out for a lump sum, agreed upon between the consumer and the utility. This condition continued until 1908, when the present manager came to Oconto and took active charge of the plant. At that time an inspection was made to determine what fixtures were being supplied with water, and after Jan. 1, 1909, bills were rendered in accordance with the rates established in the franchise. Before this change was made, however, the original application of the Oconto City Water Supply Company for valuation of its property and other relief had been filed with the Commission on Nov. 13, 1908. During the year 1909, and until the Commission's order of Feb. 28, 1910, was issued, the utility attempted to enforce payment for its services according to the franchise rates. The result of this was disastrous to the utility. A large number of consumers, feeling that the rates imposed amounted to more than the value of the service, discontinued their patronage. The situation was further complicated by the ease and cheapness with which flowing wells can be secured in Oconto. A large number of such wells have been drilled and equipped and are now supplying water to former patrons of the water company. The two following tables contain a summary of consumers who discontinued the service of the water company from Jan. 1, 1909, to Sep. 20, 1910, with number and nature of fixtures and the amounts paid per year prior to 1909, and the amounts which would be charged according to the franchise rates. Those listed in the first table are now supplied from a single private well, and the second table lists those who are now being supplied from various wells scattered throughout the city.

FORMER CONSUMERS OF OCONTO CITY WATER SUPPLY CO.

NOW SUPPLIED BY LUCKENBACH.

Disconnected between Jan. 1, 1909 and Sept. 20, 1910.

Register number.	Class.	Rooms.	Faucets.	Wash-stands.	Closets.	Baths.	Boilers.	Hose connections.	Miscellaneous.	Former annual rate.	Charge under present rates.
544	R²	6	....	......	....	....	....	......	Standpipe........	$5 00	$10 00
545	R	7	2	1	1	1	....	1	Horse.........	....	24 00
546	R	....	....	......	....	....	....	......	....	5 00	8 00
547	R	10	2	2	2	1	....	1	....	20 00	28 00
548	R	7	1	......	1	....	....	......	....	16 00	16 00
549	R	....	1	1	1	1		......	....	17 00	19 00
550	R	10	2	2	2	1	1	......	3 laundry faucets...	20 00	39 00
552	R	8	....	......	....	....	....	......	Standpipe............	5 00	8 00
554	Theater	....	1	......	1	....	....	......	....	30 00	14 00
555	O	..	1	......	1	....	....	......	....		10 00
556	O	....	....	2	1	....	....	......	....		13 00
527	5	....	1	......	1	....	....	......	....		11 00
558	O	....	1	......	....	....	....	......	....		5 00
559	O	....	....	......	....	..	....	......	....		5 00
561	O	....	1	......	1	....	....	......	....		10 00
563	S	....	1	......	1	....	1	......	Siphon jet............		39 00
564	Sa	....	1	1	1	....	....	......	Urinal & beer pump.		37 00
565	R	6	1	......	1	....	....	......	....	10 00	11 00
566	O	....	1	......	1	....	..	......	Fountain............	11 00	17 00
567	O	....	2	......	1	....	....	......	Cuspidor............	6 00	13 00
568	Sa	....	1	......	1	....	....	......	Urinal & beer pump.	44 00	34 00
569	H	22	....	3	2	....	....	......	....		43 00
										$189 00	$414 00

FORMER CONSUMERS OF OCONTO CITY WATER SUPPLY CO.

SUPPLIED FROM PRIVATE WELLS.

Disconnected between Jan. 1, 1909 and Sep. 20, 1910.

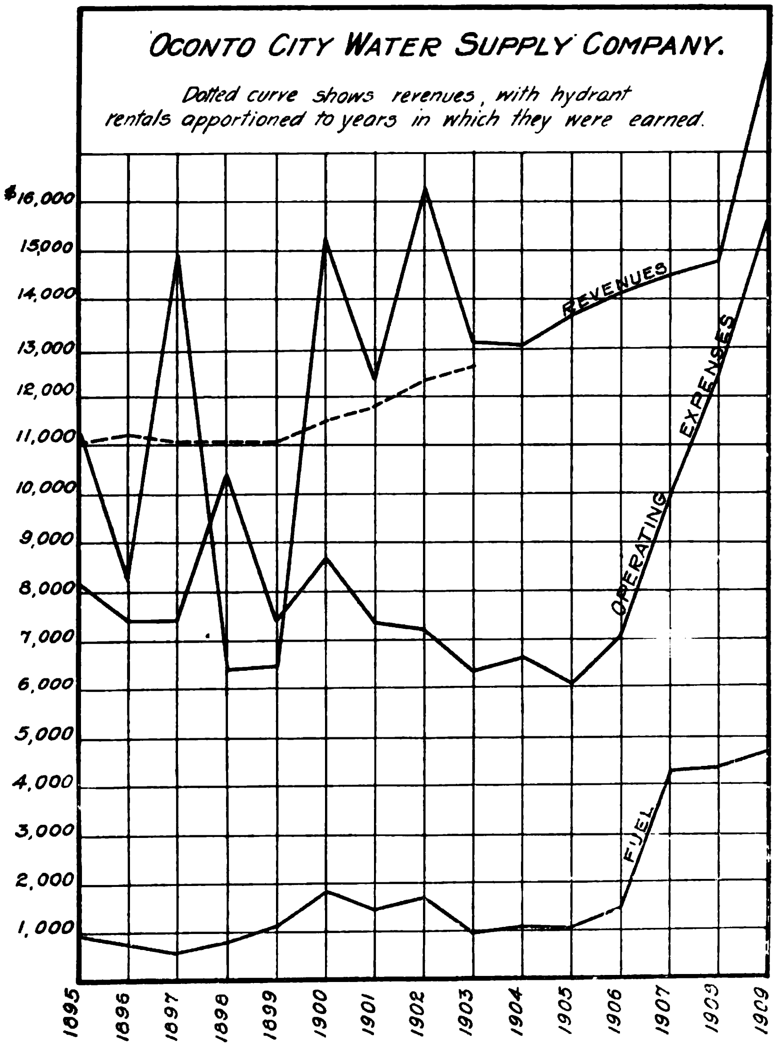
Register number.	Class.	Rooms.	Faucets.	Wash stands.	Baths.	Closets.	Hose connections.	Horses.	Cows.	Other.	Annual charge under old rates.	Annual charge under new rates.
27	B							9			$32 00	$19 50
28	R	10										10 00
29	Sa		3									18 00
75	R	8							1		5 00	8 00
77	R	5						1	1		5 00	11 00
162	R	5									5 00	5 00
170	R & B	13	2	1	1	2	2		1	2	23 00	35 00
173	B. R. & Sa.	7	1					1	1		7 00	25 00
186	B		1				1	1			9 00	9 00
187	R	6										6 00
195	R	10									8 00	10 00
208	B. R. & S.	7	1				1	1			6 00	17 00
213	R	8									5 00	8 00
217	R	5									5 00	5 00
218	R	9	1	1	1	1					23 00	42 00
218	S		1			1						
218	Barber shop									2		
238	Sa		1	1		1				2	45 00	37 00
239	R	14		2	1	1	1			2		31 00
242	R	6									5 00	6 00
243	R	6	2						1		5 00	10 00
247	R	10									6 00	10 00
249	R & B	8							1		5 00	10 00
257	R	9	2	1		1	1			2	22 00	26 00
268	R & Bakery	7						1			12 00	26 00
310											14 00	24 00
331	Bdg. H. & Sa.	14									15 00	33 00
332	B							5			9 00	10 00
348	R	11									5 00	11 00
374	S										5 00	6 00
169	R	9					1				5 00	9 00
494	R	7									6 00	7 00
498	R	8									5 00	8 00
585	R										5 00	5 00
586	R	6	1								5 00	6 00
590	R	6	1								5 00	6 00
599	S		1								4 00	6 00
610	R	7	1			1						9 00
614	R	12		1	1	1					16 00	23 00
615	School											25 00
616	Church										5 00	6 00
618	R	13	2	1	1	1	1				19 00	26 00
											$356 00	$604 50

Respondent's answer to the application of the Oconto City Water Supply Company for an adjustment of rates states that the advance in rates, which resulted from the application of the rates prescribed by franchises, amounted to about 40 per cent on the average, which statement appears to be substantially correct. The increase for the consumers listed above, however, who have discontinued the service amounted to practically 100 per cent. Both the management and the consumers appear to have acted in this matter without a great deal of foresight, the management in antagonizing its patrons at the same time that its application for relief was before this Commission, and the patrons in withdrawing their patronage without waiting for an adjustment of the difficulties. Counsel for the respondent pointed out very clearly that such action on the part of patrons could not but cripple the utility, for whose services there is an absolute necessity in the city. Both parties seem to be of the opinion that the limit has been reached in discontinuing the service of the water company, and that with a proper schedule of rates the business may again be built up to a point of normal saturation of the territory supplied.

The determination of what constitutes a normal operating expense for the applicant has been especially difficult, for the reason that no single year could be accepted as typical. The accompanying diagram shows the revenues, total expenses, and fuel expenses for each calendar year from 1895 to 1909, inclusive. Revenues, as shown on the diagram for 1909, are the revenues as charged on the books of the company according to the franchise rates, and are not the actual revenues as collected. Operating expenses, as shown on the diagram, include general law expenses, which, for the earlier years especially, were not really an expense of operation, but do not include dividends, depreciation, or construction.

The most noticeable feature of the curve of operating expenses is the sudden and remarkable increase since 1906, following a period of gradually decreasing expenses. From 1906 to 1909 expenses have more than doubled. The decrease from 1900 to 1905 was due partly to the decrease in general law expenses. A very large portion of the increase since 1906 may be accounted for by reference to only a few items of the income account.

The operating expenses prior to 1906 can have but little value in arriving at normal operating expenses. From the facts which we have before us, there seems to be no question that the policy of the company during these years was rather a makeshift one. The principal owners were not on the ground to give personal attention to the handling of the plant and development of the business, and the plant does not appear to have been maintained at a very high degree of efficiency. On the other hand, expenses have risen so rapidly since 1906 that it would not be fair to take the expenses for the last year shown as constituting the normal expenses of the plant, without examining the causes of the increase very carefully. Reference to the curve of fuel expenses


OCONTO CITY WATER SUPPLY COMPANY.
Dotted curve shows revenues, with hydrant rentals apportioned to years in which they were earned.
$16,000
15,000
14,000
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
REVENUES
OPERATING EXPENSES
FUEL
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909

shows that practically all of the increase of expenses during 1907 is accounted for by the increased cost of fuel. For the next two years, however, the total operating expenses continue to increase very rapidly, while the fuel cost remains nearly constant.

The causes of this continued growth of operating expenses are shown clearly by a further examination of the detailed statement of operating expenses. For this purpose we have included here a statement of operating expenses for the calendar years 1908 and 1909, and for the fiscal years ending June 30, 1909, and June 30, 1910:

OPERATING EXPENSES
OCONTO CITY WATER SUPPLY CO.

	Calendar year 1908.	Year ending June 30, 1909.	Calendar year 1909.	Year ending June 30, 1910.
STEAM POWER PUMPING:				
Boiler plant operating labor	$963 25	$1,279 03	$1,300 83	$975 68
Pump labor	464 85	646 92	701 96	526 51
Fuel for steam	4,381 22	5,475 87	4,637 65	2,779 95
Maint. boiler plant equip	315 05	438 54	426 65	135 39
Pumping station sup. and exp	404 96	372 66	202 53	138 98
Maint. of pumping equip	45 51	92 96	92 16	20 65
Maint. of source of supply	129 54	114 37	268 06	208 97
Maint. of bldgs., etc	14 84	248 57	271 11	36 00
Maint. of reservoir	....	40 48	93 48	....
Total steam power pumping	$6,719 22	$8,709 40	$7,994 43	$4,622 33
DISTRIBUTION:				
Street dept. labor	$38 84	$79 60	$345 88	$605 12
Customers' premises exp	2 85	3 00	15	....
Street dept. sup. and exp	18 05	60 47	53 86	60 85
Maint. of mains	65 35	118 95	107 63	63 96
Maint. of services	121 24	66 68	17 54	6 59
Maint. of hydrants	54 87	129 58	80 53	11 35
Maint. of meters	2 70	3 63	93	60
Total distribution	$303 90	$461 91	$606 52	$748 47
COLLECTION EXPENSES	$339 33	$354 33	$15 00	....
GENERAL EXPENSES:				
General office salaries	$265 00	$706 65	$1,141 65	$1,066 66
General office rent	31 00	71 00	160 00	....
Gen. office sup. and exp	433 71	530 11	534 03	503 91
Law expenses—general	224 20	415 20	191 10	15 00
Misc. general expenses	581 32	857 91	300 84	91 67
Railroad comm. expenses	....	384 05	2,137 38	1,916 69
Total general expenses	$1,535 23	$2,973 92	$4,465 00	$3,593 93
UNDISTRIBUTED:				
Insurance	$56 50	$76 50	$83 73	....
Stationery and printing	33 75	28 00	28 00	$63 73
Undistributed sundries	723 05	713 51	782 23	....
Total undistributed	$813 50	$818 01	$893 96	$63 73
TAXES	$2,701 30	$2,701 30	$4,228 92	$4,228 92
Total, all expenses	$12,412 48	$16,018 87	$18,203 83	$13,457 38

The increase of expenses from 1907 to 1908 seems to be mostly due to better maintenance of equipment. For the year 1907 the reports fail to show any expense in connection with the distribution system. It is probable that maintenance expenses during the period covered by the above table are somewhat abnormal. From what we have learned with reference to the policy of the company prior to the time that active control was taken by the present management, it appears that the plant had not been maintained at a very high level. This is borne out by the following summary of expenditures for maintenance since the control of the property was taken by the Oconto City Water Supply Company. This table includes the total expenditures for maintenance of boiler plant equipment, pumping equipment, source of supply, buildings, fixtures and grounds, mains, services, hydrants, and meters:

Year	*Amount*
1894	$40.09
1895	60.33
1896	00.00
1897	6.65
1898	184.05
1899	66.10
1900	59.81
1901	00.00
1902	54.07
1903	156.99
1904	$365.84
1905	8.25
1906	308.19
1907	184.92
Total of above....	$1,495.29
1908	434.05
1909	931.44
Year ending June 30, 1909	815.22
" " June 30, 1910	348.34

This table indicates that the greatest expenditures for maintenance took place during the years 1908 and 1909, that is, immediately after the present manager took charge. For the fiscal year ending June 30, 1910, the total cost of maintenance of the portions of the plant included in the above table was $348.34, indicating that the plant had been brought into an efficient condition, and that the abnormal expense of maintenance was no longer present. It may not be fair to compare costs of maintenance at present with those costs during the early life of the plant, but if a comparison is made with the past six or seven years, a fair index of maintenance expense may be reached. The average expenditures for this purpose for the calendar years from 1903 to 1909, inclusive, were $341.38. Both parties agree that the plant is in good condition now, and it has been kept in good condition at an average expense for maintenance of $341.38 for seven years, which seems to show that the maintenance expenses of $348.34, as reported for the year ending June 30, 1910, are about normal.

For the year 1909 we find a large increase over the expenses of 1908, but a large part of this is accounted for by Railroad Commission expenses and by increased taxes. The most equitable method of dealing with Railroad Commission expenses is to distribute them over a series of years and allow a part of them to be treated as an operating expense each year, and this method has been followed in making up the final statement of operating expenses.

Taxes for 1909 are far above the general level for preceding years and also above the taxes for the past year. For 1908 taxes amounted to $2,701.30; for 1909, to $4,228.92; and for 1910, to $3,004.03. Taxes actually paid for 1910 were somewhat higher than this, as they were not paid early enough for the company to avail itself of the discount for prompt payment, but in estimating expenses for the future, the net amount should be used.

The reason for the great increase in taxes from 1908 to 1909, as stated by the attorneys in this case, was that both parties attempted to gain a strategic advantage in connection with the valuation. For a number of years prior to 1909 the personal property of the applicant had been assessed at $90,000, but the assessment for 1909 was raised to $157,500, with the evident expectation that the company would object to the valuation and attempt to have it reduced, and that this attempt would be used as evidence before the Railroad Commission to keep the valuation of the plant, for rate making, low. The company, however, preferred to pay taxes on the entire assessment, rather than object to the valuation so fixed. Now the applicant argues that the excess of about $1,200 over the taxes for the past year should be distributed over a period of five or six years and counted as an operating expense for those years. The assessed valuation of the personal property of the applicant at the last assessment was placed at $100,000. Inasmuch as the value of $157,500 is $32,500 in excess of the valuation fixed in this case, it hardly appears just to distribute all of the $1,200 over a six year period. If taxes are estimated at $3,100 per year, we believe that sufficient allowance will be made for the increased taxes of 1909.

Another item of expense which needs to be examined carefully, is that of fuel. The diagram given above shows that fuel expenses increased from less than $1,500 in 1906 to over $4,000 in 1907, and have remained above $4,000 since that time. The average of fuel expenses, as reported for the calendar years 1907, 1908 and 1909, is $4,425.61, and for the fiscal years ending June 30, 1909, and June 30, 1910, is $4,127.91. These amounts may not be entirely accurate, because fuel was not always paid for in the same year that it was used, but they indicate rather closely what the expenses have been.

The reasons given by the company to account for the sudden increase in fuel expenses are four in number, as follows:

First. The carrying of a higher pressure for domestic service during 1907 than during 1905 and 1906. Up to the end of 1906 it appears to have been the policy of the utility to keep the pressure at about 35 lbs. during the day and to reduce it to about 25 lbs. at night. About the end of 1906 the city authorities insisted that pressure be kept up to the franchise requirement of 40 lbs. Also, it was shown that the gauge registered about 10 lbs. too high for several years before 1907, so that the actual day pressure was only about 25 lbs. This change of pressure, necessitating faster operation of the pumps and more work, naturally made it necessary to use more fuel.

Second. The larger quantity of water pumped during the year 1907. This was undoubtedly due very largely to the first cause. The increase is shown in the table given below, showing the total number of strokes of the domestic pump per year from 1903 to 1910, inclusive.

Third. The increased use of the air compressor. The use of the air compressor is acknowledged to be an expensive method of pumping water from the wells, although the fuel used for this purpose forms a small part of total fuel. The following table shows the number of strokes of the domestic pump and number of hours use of the air compressor per year:

Year.	Strokes of pump.	Air compressor.
1903	7,117,078	....
1904	6,852,052	....
1905	6,565,695	210 hrs. 45 min.
1906	8,702,402	1817 " 15 "
1907	11,772,031	3986 " 15 "
1908	11,969,385	4600 " 15 "
1909	11,877,146	2388 " 30 "
1910	11,465,313	1764 " 30 "

Fourth. The increased price of fuel. During the year 1907 the average price of wood was about 15 per cent higher than in 1906, and shavings, which the company states had been the principal as well as the cheapest fuel, were becoming scarcer.

These four reasons explain why the fuel cost since 1907 should be considerably higher than it had been before, but an average of over $4,000 per year still seems too high. With regard to fuel, the years 1908 and 1909 may be regarded as periods of experimentation. The cost of wood during 1907 was so high that the present manager, upon taking charge of the plant, began searching for a cheaper fuel. For some time the results did not appear to have justified the change, as the fuel cost did not decrease, but at present the cost is being reduced materially. The fuel used at present is a mixture of anthracite dust and Yioughiogheny screenings, and the total cost of coal from Dec. 13, 1908, to Feb. 1, 1911, was $8,738.99, or an average of $4,090 per year. From July 24, 1910, to Jan. 31, 1911, the cost of fuel was $1,686.55, or at the rate of about $3,260 per year. During this latter period pressure was maintained at 30 lbs., which both parties state is adequate for the needs of the domestic service. Part of the reduction of fuel cost during the latter part of 1910 appears to have been due to the reduced pressure and part to better methods of firing and a better understanding of the fuel properties of the coal. The manager of the water company also stated that further economies could probably be made as employes become better acquainted with the use of the coal.

Another factor which has tended to keep the fuel expense at a high point, has been the excessive slippage of the domestic pump. The testimony shows that, although no tests of slippage were made, this probably amounted to 25 per cent of the total pumpage indicated by the counter on the pump. The reduction of this slippage might naturally be expected to effect a considerable saving in fuel expenses. About the middle of February, 1911, the domestic pump was repaired and fuel and pumpage records kept for a period of about two weeks. Temperature records covering this period from Feb. 20 to March 2, inclusive, were also kept. The records show that weather during this period was unusually mild, considering the time of the year. As a result the pumpage might be expected to be somewhat less than is usually the case during February, as comparatively little water would be allowed to waste to prevent freezing. If a comparison be made, however, between the number of strokes of the pump during the eleven days covered by this test and the first eleven days of November, 1910, at which time pressure was kept at the same point as during the time of the test, a fairly correct index of the slippage may be obtained. During the first eleven days of November, 1910, the total number of strokes of the pump was 311,020, and for the eleven days of the test 194,420 strokes, indicating that a slippage of more than 30 per cent had been remedied by repairing the pump. The total amount of coal used during this time was 44,427 lbs., or 22.21 tons. At $3.75 per ton this amounts to $83.29, or at the rate of $2,765 per year, assuming that the rate of use would be the same. For the eight years, 1903 to 1910, inclusive, the average daily strokes of the domestic pump, including day and night pumpage, are given below:

AVERAGE DAILY STROKES OF PUMP.

Month.	Total.	Day.	Night.
January	26,060	13,564	12,496
February	26,781	13,902	12,879
March	25,941	13,680	12,261
April	25,426	13.621	11.805
May	26,309	14,178	12.131
June	26,767	14.662	12,105
July	27,663	15,111	12.552
August	26,890	14,739	12,151
September	25,393	13,845	11,548
October	24,971	13.511	11,460
November	25,250	13.538	11,712
December	25,897	13,677	12,310

Following are the strokes of the pump for eleven days of February and March, since the pump was repaired:

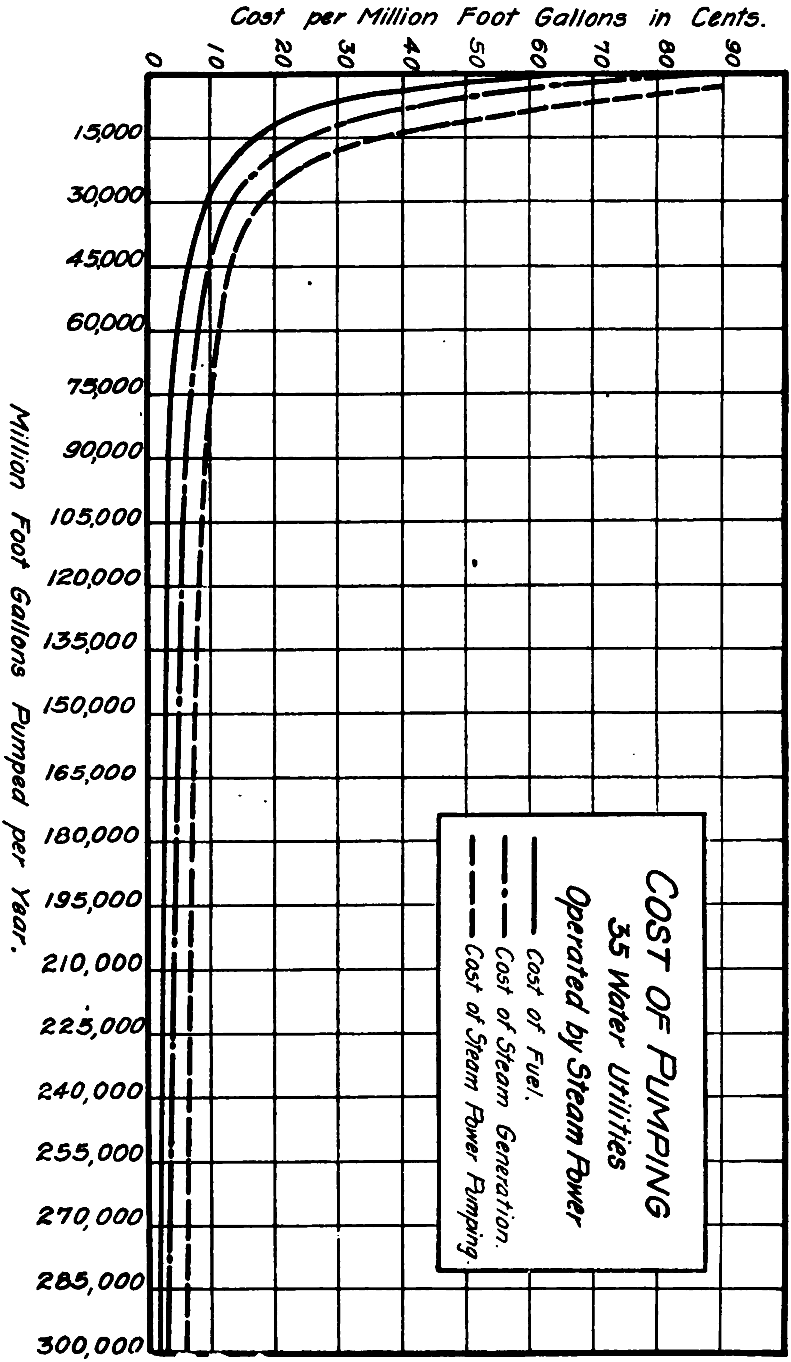
Date.		Total	Day	Night
Feb.	20	19.220	9.810	9,410
"	21	18,620	9.910	8.710
"	22	18,620	9.610	9,010
"	23	18.120	9,510	8.610
"	24	17,620	9.710	7,910
"	25	16,320	8,910	7,410
"	26	16,220	8,610	7,610
"	27	16.920	9.210	7.710
"	28	17,620	9.310	8,310
March	1	17.520	9.310	8,210
"	2	17,620	9,110	8,510

Under usual weather conditions the daily pumpage during February has been somewhat above the average for the entire year, but it seems that the pumpage under the weather conditions prevailing during the eleven days of the test may be accepted as about the average pumpage for the year, and $2,765 as approximately the cost of fuel.

Just what effect the elimination of excessive slippage will have upon fuel, is a matter that engineers are not agreed upon. Under present conditions of operation, the rate of saving seems to be about $500 per year, or the difference between $3,260, the annual rate from July 24, 1910, to February 1, 1911, and $2,765, the annual rate as indicated by the tests after remedying the slippage. The manager of the utility expressed the opinion that the point of most economical use of fuel had not yet been reached, and that some further saving could be expected. It may be, too, that the amount of fuel used during the period of the test immediately following the repairing of the pump is somewhat higher than it will be after the pump has been in use for a few months, but as nearly as we can check the fuel expenses, it appears that $2,750 per year will be sufficient to provide for fuel under present conditions of operation.

The yearly pumpage, judging from the pumpage since the repairing of the domestic pump, will be about 142,000,000 gallons, or it may be as high as 150,000,000 gallons, instead of approximately 250,000,000, as indicated before the slippage of the pump was remedied and while pumping was done against 40 lbs. pressure. If pumped against 30 lbs. pressure, 150,000,000 gallons would be equivalent to about 10,500,000,000 foot-gallons, and the fuel cost would be 26.2 cts. per million foot-gallons.

The following diagram shows the typical or normal fuel expense for steam power water utilities in Wisconsin per million foot-gallons. According to this curve the expense per million foot-gallons for a plant, such as that of the applicant, would be about 22 cts. per million foot-gallons. It should be remembered, however, that the Oconto plant must pump continually, day and night, and the expense per unit of pumpage is necessarily higher than if it could be operated to its full capacity for from eight to twelve hours per day. Differences in the price of fuel for the different utilities shown on the fuel curve will also cause a considerable difference in the price per unit. In view of these facts it appears that $2,750 is a reasonable and normal annual expenditure for fuel for a utility operating under the conditions prevailing at Oconto.


Cost per Million Foot Gallons in Cents.
0
10
20
30
40
50
60
70
80
90
Million Foot Gallons Pumped per Year.
15,000
30,000
45,000
60,000
75,000
90,000
105,000
120,000
135,000
150,000
165,000
180,000
195,000
210,000
225,000
240,000
255,000
270,000
285,000
300,000
COST OF PUMPING
35 Water Utilities
Operated by Steam Power
Cost of Fuel.
Cost of Steam Generation.
Cost of Steam Power Pumping.

Counsel for the respondent called attention to the fact that the city of Menasha, using an oil engine, pumps its water at an expense greatly below that of the average steam plant in the state, of about equal capacity. It seems, however, that a computation of fuel expenses for the Oconto plant should not be based upon the cost of a single oil engine, any more than it should be based upon the cost to a steam pumping plant which operates at an unusually low cost. The fairest comparison seems to be a comparison with plants operated by the most usual means, as shown by the diagram.

Counsel for the respondent introduced the testimony of George W. Nistle, an engineer retained by the city, to the effect that fuel expenses could be cut far below the amount which we have arrived at. Mr. Nistle seems to leave out of consideration the fact that cost per unit of work done decreases with increased amount of work, as indicated by the diagram. Testimony of Mr. Gray, consulting engineer for the applicant, contradicted that of Mr. Nistle in regard to some of the economies suggested, and there appears to be considerable doubt as to the practicability of the methods proposed. The expense which we have stated above, $2,750, is so closely in accord with the experience of the smaller water utilities in this state that we believe it to be as low an amount as will be just to the utility. By comparison with other water plants it appears to be fair, also, to the public. In view of the fact that the management has been putting forth its best efforts to reduce the cost of fuel, and that the results obtained appear about normal by comparison with other water utilities, it seems that $2,750 per year is as close to the correct expense as can be obtained in this investigation.

It was intimated by counsel for the respondent that expenses had been kept above the proper point in order to secure high rates for service, upon the decision of this case. The facts, as we have been able to learn them, do not substantiate this contention. The management seems to have made conscientious efforts to reduce the cost of operation and has pointed out, in a number of instances, possibilities of economizing, which had not been suggested by the respondent. Whether the results obtained have been as great as more experienced management would have secured, may be a question, but there is no doubt that reasonable efforts to economize have been made and there has been no attempt on the part of the applicant to make necessary expenses appear high, with the exception noted later in this discussion.

Another index of the reasonableness of the fuel expense of $2,750 may be had by comparing the ratio of fuel to total expenses for a number of plants. The following table makes such a comparison between the Oconto water plant and 40 other water utilities operating by steam power:

Plant number.	Fuel expense.	Ratio of fuel expense to operating expense, excluding taxes, depreciation and Railroad Commission expenses, per cent.
1	$3,438	12.2
2	2,098	15.4
3	39,898	16.8
4	8,040	18.4
5	3,523	19.8
6	3,579	20.0
7	1,667	25.4
8	6,313	22.1
9	3,460	23.4
10	1,057	26.5
11	5,044	28.2
12	2,864	27.9
13	556	28.7
14	4,771	28.8
15	4,852	31.5
16	6,201	32.1
17	2,388	33.0
18	1,490	33.2
19	2,286	33.9
20	8,466	35.1
21	4,581	35.6
22	1,795	38.6
23	1,825	36.6
24	7,732	36.7
25	569	37.2
26	1,688	37.5
27	1,466	39.5
28	839	40.1
29	6,300	41.5
30	2,738	41.7
31	1,124	42.0
32	1,076	42.2
33	1,885	43.5
34	522	43.6
35	2,027	45.1
36	117	45.2
37	4,949	46.0
38	1,377	47.3
39	3,666	49.5
40	715	50.3
Average	3,974	33.8
Median	2,337	35.3
Oconto, 1909	2,750	26.9
Oconto, 1910	2,750	37.7

The ratios given for the Oconto utility are based upon expenses as reported for the fiscal years ending June 30, 1909, and June 30, 1910, but a fuel cost of $2,750 is substituted for the reported cost of fuel.

It may be objected that fuel expenses appear relatively low because other expenses are unusually high, but this does not seem to hold true, especially of the year ending June 30, 1910, yet for that year the fuel expense is only a little above the average.

Regarding general expenses, counsel for the applicant argued that these should amount to about $3,500 per year, including in this amount a portion of the Railroad Commission expenses, distributed over a number of years. Excluding Railroad Commission expenses, the general expenses have been as follows:

For calendar year 1908	$1,535.23
For fiscal year ending June 30, 1909	2,589.87
For calendar year, 1909	2,327.62
For fiscal year ending June 30, 1910	1,677.24

If Railroad Commission expenses are distributed over a number of years so as to consider $500 as an operating expense each year, this would leave $3,000 per year as the applicant's estimate of other necessary general expenses. The present manager does not appear to have drawn any salary during the time covered by the above statements of general expenses. A large part of the manager's time, however, has been devoted to the handling of this case before the Commission, and it is a question how much should be allowed for general office salaries under ordinary conditions of operation. A large increase has been made in the amount of general office salaries during the past two years. If any considerable further increase is made in general office salaries, it ought to be with the expectation that more efficient and better paid management would effect a reduction of expenses at other points. In a plant the size of the Oconto utility it would seem that the duties of manager and superintendent could be consolidated, or if this is not done in practice, the allowance for salaries in a rate-making case should be made upon this basis. An allowance of $1,200 for general office salaries under present conditions ought to be adequate. If more than this is expended, a decrease at some other point may be looked for. There are a number of larger utilities in the state in which the duties of superintendent and manager are combined. In such a case probably half of the salary paid to a manager should be considered a general office salary, which would make about $1,200 sufficient for general office salaries.

On the basis of the above examination of expenses, it appears that the normal operating expenses of the utility will be made up about as shown in the following table. In making up this table of expenses, an average of the calendar years 1908 and 1909, based on the Commission's audit, has been taken for expenses which have not been fixed in the preceding pages. Maintenance expenses are based substantially upon the estimates made above.

NORMAL OPERATING EXPENSES.

PUMPING	
Boiler plant operating labor	$1,132.04
Pump labor	583.41
Fuel for steam	2,750.00
Maintenance of boiler plant equipment	135.40
Pumping station supplies and expenses	303.74
Maintenance of pumping equipment	20.85
Maintenance of source of supply	209.00
Maintenance of buildings, etc.	36.00
Maintenance of reservoir	10.00
Total pumping	$5,180.44
DISTRIBUTION	
Distribution system operating labor	$345.88
Customers' premises expenses	1.50
Street department supplies and expenses	35.95
Maintenance of mains	64.00
Maintenance of services	7.00
Maintenance of hydrants	12.00
Maintenance of meters	2.00
Total distribution	$468.33
COLLECTION EXPENSES	$177.17
GENERAL	
General office salaries	$1,200.00
General office supplies and expenses	483.87
Law expenses, general	207.65
Miscellaneous general expenses	441.08
Railroad Commission expenses	500.00
Total general	$2,832.60
UNDISTRIBUTED	
Insurance	$70.11
Stationery and printing	30.88
Undistributed sundries	752.64
Total undistributed	$853.63
TAXES	$3,100.00
Total of above	$12,612.17

In this table the item of distribution system operating labor has been included at the amount reported for 1909. The expenses, as we have them reported for various years, vary so greatly that no absolutely accurate statement can be made, but it is believed that the table shown here represents the expenses of operation with sufficient accuracy.

According to the computations of the engineering staff, the composite life of the plant is 53.3 years. The depreciable property, that is, the cost new, less the scrap value of property, exclusive of land, and stores and supplies, amounts to $93,866. From these facts we find that on a 4 per cent sinking fund basis the rate will be 0.565 percent, or $530 per year. On a 2 per cent sinking fund basis the annual rate would be about 1.07 per cent, which would amount to $1,004 per year. Usually the 2 per cent sinking fund method of computing depreciation on water works property has been found best, and it seems proper to make an allowance of about $1,000 per year for depreciation in this case.

If interest is computed on a 6 per cent basis, $7,500 per year will be needed for this purpose; and on a 7 per cent basis, $8,750 per year will be needed. The total expenses, then, with interest at 6 per cent will be $21,112.17, and with interest at 7 per cent, $22,362.17 per year.

The apportionment of these expenses as between output and capacity has been made upon lines followed in former decisions of this Commission, and 44.9 per cent of all expenses are found to belong under the head of variable or output expenses, and 55.1 per cent under the head of fixed or capacity expenses. The following summary shows the amounts:

SUMMARY OF APPORTIONMENT OF EXPENSES.

	Output.		Capacity.	
	6% interest basis.	7% interest basis.	6% interest basis.	7% interest basis.
Expenses, excluding taxes, depreciation and interest	$4,272 22	$4,272 22	$5,239 95	$5,239 95
Taxes, depreciation and interest	5,208 40	5,769 65	6,391 60	7,080 35
Total	$9,480 62	$10,041 87	$11,631 55	$12,320 30

Of the amount listed as capacity expenses, $12, the estimated cost of maintaining hydrants, is chargeable directly to fire service, and $187.67, made up of customers' premises expenses, maintenance of services, maintenance of meters, and collection expenses, directly to other service, leaving $5,040.28 of capacity expenses, exclusive of taxes, depreciation and interest, to be apportioned to the two classes of service.

Apportionments are made upon three bases. Capacity expenses, other than taxes, interest and depreciation, are apportioned upon the basis of the maximum demands. Output expenses, other than taxes, depreciation and interest, are apportioned upon the basis of the water used. Taxes, depreciation and interest are apportioned throughout, both capacity and output expenses, upon the basis of the investment for the different branches of service. The same result would be obtained if taxes, depreciation and interest were divided between the two classes of service before the apportionment to output and capacity was made.

Investigation by the engineering staff shows that 47 per cent of the maximum demand upon the pumping station may be exerted by the fire service, and 53 per cent by all other service. Of the plant value, 57.5 per cent was made necessary by the fire service and 42.5 per cent by all other service, as shown in the following table:

Classification.	Fire.		All others.		Both.	
	New.	Present.	New.	Present.	New.	Present.
1. Land	$1,265	$1,265	$1.265	$1,265	$2.530	$2.530
2. Wells, intakes and stations.	6,955	6,921	6.884	6.860	13.839	13.781
3. Reservoirs and standpipes	3,114	3,043	3.512	3.431	6.626	6.474
4. Distribution system	41,688	40,697	24.329	23.669	66,017	64.386
5. Pumping plant equipment	5.620	2,632	4,841	2,703	10,461	5.335
6. Buildings and miscellaneous structures	4.223	3,444	4,762	3,883	8,985	7,327
7. Office furniture and appliances	317	253	357	286	674	539
8. Tools and instruments	150	75	150	75	300	150
9. Horses, wagons and misc.	....	....	....	....	....	....
10. Add 12% (see note)	7,600	7,000	5.532	5.061	13,132	12.061
11. Stores and supplies	1,050	1,050	1,500	1,500	2.550	2.550
12. Paving	....	....	....	....	....	....
13. Non-operating property	721	674	813	760	1.534	1,434
Total	$72,702	$67.054	$53,945	$49.493	$126,648	$116,547

NOTE:—12% to cover engineering, interest during construction, contingencies, etc.

If the capacity expenses, $5,040.28, are divided on the basis of maximum demand, $2,368.94 is found to be chargeable to fire service and $2,671.34 to all other service.

Taxes, depreciation and 6 per cent interest amount to $11,600, and if interest be taken at 7 per cent, the amount is $12,850. Dividing these on the basis of the plant investment, we find that, on a 6 per cent interest basis, $6,670 is to be charged to fire service and $4,930 to all other service. On a 7 per cent interest basis, these amounts are $7,388.75 to fire service and $5,461.25 to all other service.

The apportionment of the output expenses, other than taxes, depreciation and interest, should be upon the basis of the water used, but it is not possible to determine exactly how much water is used for the different classes of service.

In the separation of property in this case, public buildings, fountains, etc., were classed under "All other service" along with private consumers.

It is probable that the unit output costs of water pumped for fire service are higher than the corresponding costs for other service, due to the use of a better grade of fuel to keep up fire pressure, but in practice it is not possible to determine this difference. The best that can be done, is to estimate the use of water for all other service and the amount of increased pumpage made necessary in time of fire.

Owing to the fact that up to February, 1911, the domestic pump was in very poor condition, it is not possible to state exactly what the pumpage amounts to per year, but, judging from the records since this pump has been repaired, the pumpage required to maintain a pressure of 30 lbs. is approximately 150,000,000 gallons per year. Neither can the exact amounts used by the various classes of consumers be stated. The almost universal use of the flat rate makes even an estimate very difficult. It may be assumed, however, that not all of the 150,000,000 gallons of indicated pumpage will actually be delivered to the mains. There is certain to be some slippage; in fact, for the most efficient operation of a pump a slip of from 5 to 7 per cent appears to be necessary. As the domestic pump has only recently been repaired, the slippage is probably at a minimum and it may be estimated that 145,000,000 gallons per year is delivered to the distribution system. The leakage in the distribution system has been estimated at 20,000,000 gallons per year, or a little less than 4,000 gallons per mile of main per day. There is no means of checking this figure very closely, but it appears to be the most reasonable one for use here.

This leaves about 125,000,000 gallons per year as the amount actually used. This pumpage, however, is the pumpage on the basis of 30 lbs. pressure. During time of fire, pressure is maintained at from 100 to 125 lbs. The regular domestic and industrial service, with the exception of sprinkling service, is supplied at the same time, so that only the excess over the amount which would be pumped to keep the pressure at 30 lbs. should be charged to fire service.

As stated above, it is not possible to determine just how much this is. The only method of estimating the amount is to determine how much of the time pressure is kept up for fire protection, and then estimate the amount of additional pumpage due to the increased pressure.

The records of the Oconto fire department, as shown by the automatic register, show that fire pressure has been maintained as follows:

For the year 1908, 29 calls, pressure maintained 21 hrs. 52 min.
For the year 1909, 32 calls, pressure maintained 32 hrs. 5 min.
For the year 1910, 50 calls, pressure maintained 25 hrs. 5 min.

The records kept by the water company do not show the same results as those kept by the city, but bear out the argument of counsel for the respondent that pressure was maintained for fire protection only a few hours per year.

The following table shows the length of time that fire pressure has been maintained for each month from 1903 to 1910, inclusive, as shown by the records of the water company. The average is about 30 hours per year. There is no record of the length of time that water has actually been used for fire protection.

TIME DURING WHICH FIRE PRESSURE WAS MAINTAINED.

Month.	1903.		1904.		1905.		1906.		1907.		1908.		1909.		1910.		Total,	
	Hrs.	Min	Hrs.	Min.	Hrs.	Min.	Hrs.	Min.	Hrs,	Min.	Hrs.	Min.	Hrs.	Min.	Hrs.	Min.	Hrs.	Min.
Jan........	2	35	2	40	8	45	1	15	1	25	2	30	3	30	2	25	25	5
Feb........		15	3	10		15	2	10	1	30	1	45	21	5	1	15	31	25
Mch........		40	2	35		40		50	....		4	45		20	6	10	16	
Apr........	1	50	3	35	8	40		20	6	40		45		20		25	22	35
May........	3	33	2	5	3	30	1	10		20	1	30	1	55	2	10	16	33
June.......		35	1	30	1			15	3	5	9	20	3	35	3	55	23	15
July.......		10		40		40	1	30		45	1	30	3	20	3	35	12	10
Aug........		45	1	30	2	50	3	5	2	10	2	40	1	40	1	55	16	35
Sept.......	6	20		40	4	30	1	15	7	5	1		1	5	1	30	23	25
Oct........	2	20	5		1	45	6		1	30	2	55		45	5	35	25	50
Nov........	2	10		10	3	25	....			45		15		30		45	8	
Dec........	1	50	3	5	9	20	2		2		1	20	1	25	2	40	23	40
Total..	23	3	26	40	45	20	19	50	27	15	30	35	39	30	32	20	244	33

To maintain 30 lbs. pressure for 30 hours requires a pumpage of about 500,000 gallons under ordinary conditions. If the full capacity of eight streams, as prescribed by the franchise, were actually being used during the 30 hours per year, the discharge from the streams would be about 2,900,000 gallons, and in addition there would be an increased leakage due to the higher pressure. In the absence of any facts regarding the amount of water actually used, we have been obliged to estimate the amount from the above figures, and have placed the amount at between 1,000,000 and 1,500,000 gallons per year. This is so small a portion of the total yearly pumpage, about 1 per cent, as to make the exact amount, within closer limits than these, a matter of no practical importance in this case.

According to this estimate the fire service should bear about 1 per cent of the output expense, excluding taxes, depreciation and interest. The total output expense, excluding these three items, was found to be $4,272.22, and the part chargeable to fire service is $42.72, leaving $4,229.50 to be met by other classes of service.

The total cost of furnishing fire protection is made up as follows:

	6 per cent interest.	7 per cent interest.
Capacity expenses, exclusive of taxes, depreciation and interest	$2,368 94	$2,368 94
Taxes, depreciation and interest	6,670 00	7,388 75
Output expenses	42 72	42 72
Maintenance of hydrants	12 00	12 00
Total	$9,093 66	$9,812 41

The cost of all other service is made up as follows:

	6 per cent interest	7 per cent interest
Capacity, excluding taxes, depreciation and interest	$2,671 34	$2,671 34
Output, excluding taxes, depreciation and interest	4,229 50	4,229 50
Taxes, interest and depreciation	4,930 00	5,461 25
Direct to the service	187 67	187 67
Total	$12,018 51	$12,549 76

As the fire service is supplied to only one consumer, it is not necessary to separate the items of taxes, depreciation and interest, as between output and capacity, but when we come to other classes of service this separation must be made. The basis for the separation is the result obtained by apportioning other expenses between output and capacity; that is, percentages used are obtained from the summary of the apportionment of other items and are 55.1 per cent capacity and 44.9 per cent output. This separation of the costs of general service between output and capacity is shown in the following summary:

COST OF GENERAL SERVICE.

	Output.	Capacity.	Direct.
6 per cent basis.			
Expenses, excluding taxes, depreciation and interest	$4,229 50	$2,671 34	$187 67
Interest, taxes and depreciation	2,213 57	2,716 43	....
Total	$6,443 07	$5,387 77	$187 67
7 per cent basis.			
Expenses, excluding taxes, depreciation and interest	$4,229 50	$2,671 34	$187 67
Interest, taxes and depreciation	2,452 10	3,009 15	....
Total	$6,681 60	$5,680 49	$187 67

The cost of fire service, based on 121 hydrants installed, is $75.15 per hydrant, figuring interest at 6 per cent, and $81.09 per hydrant if interest is computed at 7 per cent. These figures appear rather high, but there are conditions in Oconto, some of which are beyond the control of the management of the water works, which account for this high cost. The elements affecting the cost of fire service are:

1. The total investment in the plant.
2. The porportion of that investment made necessary by fire service.
3. The total operating expenses of the utility.
4. The proportion of these which is a fixed expense.
5. The maximum demand for fire service.

An examination of the total investment in the plant fails to account for the high cost of fire service. For purposes of this comparison the cost new of property has been taken and comparison is made with the cost new of other water utilities which have been valued by the Commission. Comparison is made of investment per hydrant, per commercial service connection, per million gallons pumped, and per mile of main. Following is the summary:

Plant.	Investment per			
	Hydrant.	Commercial service connection.	Mile of main.	Million gal. pumped.
A	$1,915	$142	$11,070	$977
B	1,671	186	11,100	427
C	1,442	193	12,040	376
D	1,073	160	6,850	1,016
E	1,284	129	13,500	....
F	....	158	10,350	2,790
G	1,014	268	11,700	763
H	1,063	142	10,020	648
I	788	107	8,300	687
J	1,539	129	11,400	449
K	1,438	139	11,360	610
L	1,860	244	15,350	1,043
M	1,218	218	15,100	1,269
N	1,199	214	9,950	510
O	1,020	165	9,320	745
Average	$1,323	$173	$11,161	$879
Oconto	1,046	160	8,740	844

This table shows that on each basis used the cost new of the Oconto plant is lower than the average of the utilities which have been valued, so that the high cost of fire service can not be accounted for by the investment as a whole. A relatively large part of the investment, however, is due to fire service which increases the cost by increasing the proportion of taxes, depreciation and interest which that service has to bear. A water plant located in a small city and supplying both fire and general service will usually have a larger part of its investment due to fire service than a utility in a larger city, due particularly to the increased size and weight of mains made necessary.

The power plant and pumping equipment and source of supply must be adequate to meet the demand put upon them if the utility is to comply with the fire test, so that if the fire test calls for an unusually large supply of water, the investment will be affected by this fact.

Total operating expenses of the Oconto plant are somewhat higher than the general average for water utilities, but it is difficult to secure a satisfactory basis of comparison, due to the difference in conditions of operation. A part of the high cost of fire service, however, is to be accounted for by the high operating expenses.

A rather large part of the expenses of the applicant are capacity expenses and these are apportioned on the basis of the demand on the pumping station. The fire test, in accordance with which the plant was built and is operated, calls for a larger supply of water than is required in many larger cities, and much more than is generally considered necessary in cities of the size of Oconto. It does not necessarily follow that this fire test is too high for Oconto, where a large part of the fire risk arises from the presence of large lumber mills, making necessary a plentiful supply of water for fire protection. It should be pointed out, however, that increased capacity for fire protection can be had only at increased cost, and that the large fire demand accounts for a considerable part of the high cost of fire service. As far as pumping station investment and expenses are concerned, it is little, if any, cheaper to meet a large demand for water for fire protection in a small city than in a much larger one.

A consideration of all these facts substantiates the statement of the cost of fire service given above. A comparison of costs of such service per hydrant with cost per hydrant in other cities is not a satisfactory test of reasonableness, even when costs of pumping, distribution, etc., are the same. Cost per hydrant is not a correct unit, at least not when considered by itself, for the reason that the cost is influenced to a very large extent by the fire test which the utility has to meet.

The estimate of water delivered to consumers made above places the amount at about 125,000,000 gallons per year. This includes all water used, whether by the public service other than for fires, by commercial or by industrial users. No allowance was made in estimating this total for water used for flushing mains, but this amount appears to be so small as not to affect the total to any considerable extent. The total amount of water used for this purpose does not appear to be more than 1,000,000 gallons per year, and as the 125,000,000 gallons per year is an estimate, for practical purposes it may be assumed that 125,000,000 gallons per year is actually delivered to consumers.

At present all water used by the city, with the exception of that used for fire service, is furnished free of charge. No record of the amount of water furnished free is obtainable, but the record of fixtures, buildings, and number of persons supplied has been furnished. Following is a summary of this list:

	No. of service connections.	Size of service connections.	Faucets.	Water closets.	Urinals.	Boilers.	Hose connec.	Bubble cups.	No. of people supplied.	No. of horses supplied.	Miscellaneous
High school	2	¾ inch	13	18	1	2	2	1	228	......	......
Lincoln school	1	2 "	6	11	1	1	2	1	330	......	2
Jefferson school	1	¾ "	3	10	1	....	1	......	153	......	......
Pecor school	1	¾ "	2	11	1	....	2	......	150	......	......
Engine house	1	¾ "	3	1	....	....	1	......	4	4	......
Horse troughs	5	¾ "	Automatic		....	....	......	......	....	......	......
Stone crusher	2	¾ "	....	....	....	....	......	......	......	......	......
Flush tanks	5	½ "	Automatic		....	....	......	......	......	......	......
Flush tank	1	¾ "	Automatic		....	....	......	......	......	......	......

In addition to the above, water is furnished to the city for flushing sewers and for building macadamized roads. The amount of water used can be estimated with some degree of accuracy, but no statement of the amount can be anything more than an estimate.

The amount of water used in schools is ordinarily about 14 or 15 gallons per day per pupil, where buildings are well equipped. The amount used in the Oconto schools is probably about this figure. Although some of the schools are not exceptionally well supplied with water, it seems that a considerable amount of water is used for lawn sprinkling, which will probably bring the average per pupil per day up to 15 gallons. On the basis of two hundred school days per year, this would amount to a total use of water in the schools of 2,763,000 gallons per year.

The amount of water used in the engine house is estimated at 100,000 gallons per year, although there are very few facts by which this estimate can be checked. Neither can the amount of water used by the public fountains and troughs be stated with any degree of exactness, but it is probably in the neighborhood of 1,000,000 gallons per year. The amount used by the city for operating the stone crusher cannot even be estimated with any probability of correctness.

There are six automatic flush tanks for sewer flushing purposes, five of which are supplied by ½ in. pipes and one by a ¾ in. pipe. The amount of water flowing is controlled by a shut-off on each pipe. There has been some dispute between the water company and the city as to the amount of water to be supplied through these pipes for flushing purposes. A meter placed on one of the ½ in. pipes showed that the amount of water used in one day, when the full stream was allowed to run, was nearly 7,000 gallons, and when the stream was checked to give only necessary flowage, the amount was 1,000 gallons per day. On this basis the amount used would be approximately 2.200,000 gallons. It appears certain, however, that much more than this has actually been used, probably about 4,000,000 gallons per year.

Affidavits submitted by the water company show that during 1910 the amount of water used in the construction of macadamized streets was about 375,000 gallons. For street sprinkling it seems that about 2,500,000 gallons per year have been used.

A summary of the above estimates shows that of the 125,000,000 gallons delivered to consumers, the following amounts were used for public purposes:

Schools	2,763,000	gallons
Fire station	100,000	"
Public fountains	1,000,000	"
Sewer flushing	4,000,000	"
Street construction	375,000	"
Street sprinkling	2,000,000	"
Total	10,738,000	"

In the absence of any method whatever of measuring the amount of water actually used for the above purposes, and in view of the apparently irreconcilable statements made by the officials of the water company and those of the city, it has been difficult to make even a reasonably accurate estimate of this amount, but from such information as we have been able to obtain regarding actual conditions, the amounts included in the foregoing estimate appear reliable.

That the company should receive a payment for water used for public purposes is not open to question. The total amount to be paid by the city may at first appear high, but the fact that the amount is more than the city formerly paid does not constitute evidence of unreasonableness. Rather, it goes to show that the city was not bearing its fair share of the expenses of the plant under the old schedule of rates. If the city chooses to use a large amount of water, it ought not to expect to receive that water free of charge. Owing to the uncertainty which exists as to the amount of water which is actually used by the public, meters should be used as far as practicable upon services which supply public uses. If 10,738,000 gallons per year are used for public purposes, out of a total of 125,000,000 gallons which are delivered to consumers, 114,262,000 gallons remain to be paid for by consumers other than the public.

The cost of furnishing all service—other than fire protection—was found to be as follows:

	6% basis.	7% basis.
Output	$6,443 07	$6,681 60
Capacity	5,387 77	5,680 49
Direct	187 67	187 67
Total	$12,018 51	$12,549 76

If 125,000,000 gallons per year are delivered to consumers, the output expense per thousand gallons, on a 6 per cent interest basis, is 5.15 cts., and on a 7 per cent basis, 5.35 cts. As the actual amount of water used by various consumers appears to be very nearly 125,000,000 gallons per year, the output costs per thousand gallons, as stated above, are not far from the correct amounts.

Owing to the fact that practically all of the water users of Oconto are on a flat rate basis, it is difficult to make a schedule of rates for water sold through meters which will permanently fit conditions in that city. If meters are introduced to any considerable extent, the use of water will undoubtedly undergo great changes, which may, within a few years, necessitate a readjustment of meter rates as fixed by this decision.

Both the consumers and the management seem to fear that the introduction and use of meters will be prejudicial to their interests. This situation has probably arisen from the failure of the interested parties to understand the real nature of the problems to be dealt with. At least no sound argument has been advanced against the use of meters, if it is assumed that the meter rates to be applied are correct.

On behalf of the consumers it was contended that if the utility were given the right to install meters at its own option, injustice would be done to consumers. But if a consumer wastes water, whether deliberately or otherwise, it is not clear that he would suffer any injustice from being placed on a meter basis and obliged to pay for the water which he uses, provided, of course, that the rate at which he is charged for such water is reasonable.

To argue that a meter rate, in accordance with which the consumer pays for water actually used, is unjust to the consumer, is to argue that the consumer is entitled to receive something for which he makes no payment. The success of a flat rate plan, of course, depends very largely upon the attitude of the public towards the utility. If consumers are careful and reasonable in their use of water, a flat rate system may meet with some degree of success. As soon as any user of water becomes unreasonable in his use, however, or allows the water to waste, the flat rate system breaks down in its application to that user. Under such a system the charge per fixture installed is supposed, whether rightly or not, to be sufficient to pay for the amount of water which would ordinarily and reasonably be used through that fixture. If the consumer allows his use of water to run above the limit of reasonableness, he is getting more of the product of the utility than he is paying for. After all, the flat rate plan represents, although in an exceedingly imperfect and unsatisfactory manner, an attempt to charge the consumer for what he uses, the rate for each class of fixtures being partly based upon the cost of furnishing the amount of water which would reasonably be used through such fixtures. When the use exceeds a reasonable one, unless the utility has some means of checking the waste, it may easily and often does become out of all proportion to the actual needs of the service. Then, if the utility still derives sufficient revenue, consumers who are wasteful are shifting a part of the cost of their water supply upon more careful patrons, and if the revenues are insufficient the utility is furnishing a product for which it secures nothing. From what has been said it seems clear that the flat rate plan can be a success only in cases where the use of water through any fixture is a reasonable one. When a utility sells water through a kitchen faucet, for example, to a residence of five rooms, it really sells a quantity of water, which quantity is not the maximum amount which can be drawn through that faucet, but a reasonable amount for use in a residence of the size and character in question. This "reasonable amount" is, of course, a very indefinite and unsatisfactory measure, but, such as it is, it forms the basis for the only justification of the flat rate plan. When the use exceeds a reasonable one, the nature of the fixture is no longer any index, however imperfect, of the amount of water used, and at this point some more definite and certain system of measurement must be used.

Where conditions of building and climate are such as to admit of easy and economical introduction of meters, and where the utility is financially able to install meters, it does not admit of argument that the meter basis is the correct basis on which to sell water. This is especially true in cases where the premises supplied are connected with sewer, cess-pool, or drain, where the waste of water may be very great. In this case the general introduction of meters would be rather expensive, as a large number of the buildings supplied are without cellars. The cost of installing meters on all service pipes would be so high that the utility in its present condition would have difficulty in meeting it. In view of these facts it does not seem that any general introduction of meters can be ordered at the present time. There are, however, certain classes of users who should be placed on a meter basis, even if considerable expense and some temporary inconveniences to the utility is occasioned by such action. There appears to be no question that certain of the consumers supplied by the applicant are unnecessarily wasteful in their use of water. It seems to be well established that there is a very general waste of water under a flat rate plan. If all of the waste and unnecessary use of water were uniformly distributed among the consumers, a flat rate plan would not be unjust as between consumers. Where a given consumer is unusually wasteful, however, or where the character of the fixtures which he has installed, or the use which is made of those fixtures is such that the reasonable amount to be used cannot be approximately determined, it is unjust both to the other users of water and to the utility to allow such a consumer to continue on a flat rate basis. What consumers should be metered, will be pointed out later in this decision.

Counsel for the city argued at some length that if the utility were given the right to install meters, the right to require the utility to do so should also be granted to consumers. The water company objected to such a ruling, on the ground that there would probably be a very general demand for meters, which would make it difficult for the utility to meet the additional cost of metering. Representatives of the utility also argued that if there were a very general introduction of meters, the revenues of the utility would be very much decreased, because consumers would curtail their use of water to a very marked extent, and that it would be practically impossible to enforce a provision calling for a minimum charge, because of the fact that patrons were not accustomed to a minimum charge in dealing with utility corporations.

These are not the only objections which the company has made to the introduction of meters. It was contended that the difficulty of reading meters would be very great, so that it would in many cases take from an hour to two hours time of an employe to read a single meter. It was also stated, however, that in some cases as much as an hour and a half is required to make out the bill of a single consumer on a flat rate basis, because of the difficulty of determining what fixtures should be charged for, and how they should be classed. In such cases it would appear to save time to use a meter. It is doubtful, however, whether any such amount of time as that stated will actually be required for meter reading. Where meters are properly placed, there seems to be no reason for believing that the time required for reading will be nearly as great as that mentioned by the utility. The experience of water utilities which are operating under conditions substantially similar to those existing in Oconto, contains little or nothing to show that as much time as that claimed would be required to read meters. It may well be that the cost of reading meters which are placed in pits will be greater than where they are placed in cellars or other places in which they will be easily accessible, but it does not seem that the average cost will be nearly as great as that claimed by the utility.

It was also claimed and testimony was introduced to show that the cost of setting meters in frost proof pits would be extremely high, possibly as high as $50 per meter. On behalf of the city it was testified that meters could be set in frost proof pits, constructed of sewer tile, at a cost not exceeding $12 or $15 per meter.

Another objection which the utility made to any general plan of metering, was that in many instances a single service pipe supplied two or more consumers who were not in the same building and that it would not be practicable to use meters, because a meter installed for the first consumer would measure all the water used by all of the consumers supplied and not only what was used by the first consumer.

An examination of these objections makes it appear that in many cases they are more imaginary than real. As a general rule it seems that such consumers as should be metered have their premises equipped with cellars or other places where a meter may be placed without danger from frost. There will probably be a few exceptions to this, but in such cases, if meters are properly installed, there appears to be no reason to anticipate that the expense of reading them will be as high as estimated by the utility. The same thing seems to hold true with regard to the cost of setting meters. In the greater number of cases no expense need be involved other than that of making the connections, and even in cases where pits have to be constructed the cost is not likely to be nearly as great as estimated by the company. Where consumers are situated so that the same service pipe leads from the main to the premises of one consumer, and then to another, and, it may be, to a third or fourth consumer, it would seem to be possible, in case there are cellars, to meter each one on the branch which actually supplies his premises. Where there are no cellars, separate meters can still be installed and the amount used by each consumer determined.

A still further objection to metering was, that some consumers have more than one service pipe leading from the main, the additional one usually being for the purpose of supplying water for lawn sprinkling, which the company contends would necessitate the installation of more than one meter. In such cases meters on lawn services would have to be installed in pits, which would involve considerable expense in addition to the cost of the meter itself.

Most of the objections which have been urged are objections which have been successfully overcome by a great many water plants which have found that the introduction of meters was the most acceptable method of dealing with consumers. Such difficulties, as are peculiar to the case under consideration, appear to be due, at least in large part, to the improper methods pursued by the water company for a number of years. If services had been put in by the company, at least as far as the curb line, there would be no difficulty in determining just what connections actually exist. The confusion in the present situation appears to be very largely due to the failure of the utility in times past to enforce a reasonable regulation relating to the installation of services. The fact that such difficulties exist, however, can hardly justify the failure to install meters in cases where they clearly are needed. If the management of the utility in the past has permitted these difficulties to arise because of its failure to make and enforce reasonable regulations, as appears to be the case in Oconto, the fact of such failure can hardly justify the utility at the present and for the future in failing or refusing to adopt means of disposing of its product which would otherwise be reasonable. Managerial inefficiency or error in the past cannot mean that such error, or the result of such inefficiency, should never be corrected, although they may make the task of the present management more difficult than it otherwise would be. If the expense involved is larger than would ordinarily be the case, due to conditions which have arisen because of lax management, it would seem to be a proper duty of the present management to assume such expense and not allow the added cost to stand in the way of the judicious extension of the meter system.

It is the duty of the utility to install meters at its own expense and sell its product on a meter basis, unless exempted from so doing by the Commission. Owing to the conditions which have been pointed out in the preceding pages, it seems that the applicant should be exempted, except in such cases as are hereafter specified, or as it may see fit to install meters, but consumers must be allowed to put in meters at their own expense and pay for water used upon a meter basis, if they choose to do so. Inasmuch as any rate which can be made at this time, especially a rate for metered service, can hardly be expected to fit conditions for a considerable time to come, a readjustment may be made at such time as it appears necessary, which readjustment can be made to cover both the rates and the matter of final ownership of meters.

In order to determine what rates should be made at this time, it is necessary to analyze the statistics relating to number and class of consumers and number and nature of fixtures in use. The data submitted by the utility cover the calendar year 1910, and have been divided into three groups. The first group contains the active consumers as of Jan. 1, 1911; the second, those consumers who were supplied with water during 1910, but who had not paid their bills at the time the consumer data were filed with the Commission, and whose shut-off notices have expired; and the third group contains those who have actually been shut off because of non-payment or vacation of the premises supplied. The following table is a summary of the consumers and fixtures supplied with water which were regarded as active at the time that the consumer data were submitted:

SUMMARY OF ACTIVE CONSUMERS.

	First faucets.	Additional faucets.	No. of users.	No. of rooms above 5.	Hose.	Baths.	Wash basins.	Water closets.	Steam heaters.	Stable faucets.	Yard fountains.	Horses first.	Horses additional.	Cows.	Urinals.
Residence—1 apartm..	482	70	482	953	96	118	132	161	10	5	1	....	....	....	....
Residences—flats... .	20	....	25	72	....	....	1	4	....	....	....	....	....	....	....
Stores	11	1	14	....	2	1	3	7	2	....	....	....	....	....	....
Halls, pool-halls etc..	8	....	9	....	2	....	4	8	1	....	....	....	....	....	1
Residences with other uses in connection.	13	4	13	21	5	7	7	11	....	1	1	1	7	1	....
Saloons, etc...	17	14	19	95	2	4	13	25	1	....	....	....	....	....	11
Offices.................	9	....	17	2	....	....	7	9	1	....	....	....	....	....	....
Barns	5	2	5	....	1	....	....	....	....	....	....	5	98	4	....
Barber shops..	5	....	6	....	....	1	1	....	....	....	....	....	....	....	....
Court house...........	1	2	1	....	3	....	5	8	1	....	....	...	....	....	....
Photo galleries........	2	....	2	....	....	....	....	1	....	....	....	....	....	....	....
Churches	1	....	2	....	2	....	....	1	....	....	....	....	....	....	....
Warehouses and elevators..............	2	..	2	....	....	....	....	....	....	....	....	....	....	....	....
Post office............	1	....	1	....	....	....	...	1	....	....	....	....	....	....	....
Blacksmith shop......	....	...	1	....	....	....	....	1	....	....	....	....	....	....	....
Bakeries and restaurants.................	2	....	2	...	....	....	....	1	....	....	....	....	....	....	....
Hospital...............	1	2	1	9	....	1	2	2	1	....	....	....	....	....	....
Convent and school...	1	1	1	3	1	1	1	1	....	....	....	....	....	....	....
Depots.................	1	....	2	....	2	....	3	3	1	....	....	...	....	....	....
Hotels, etc.............	6	4	6	97	1	4	8	9	1	....		....	....	....	....

Besides the fixtures shown in the foregoing table, there are nine barber chairs, four pool-tables, five cellar pumps and motors, twelve beer pumps and two fountain cuspidors. There are also seven stores, two offices, one meat-market, and two tailor-shops in connection with residences, which have been put in the mixed residence class, four residences and thirteen hotels in connection with saloons, and one residence and two banks in connection with offices.

The next table is a summary of fixtures used by consumers whose shut-off notices had expired at the time that the consumer data were submitted to the Commission, but who were not yet disconnected from the mains of the water company:

SUMMARY OF CONSUMERS WHOSE SHUT-OFF NOTICES HAD EXPIRED.

	First faucets.	Additional faucets.	Number of users.	No. of rooms above 5.	Hose.	Baths.	Wash basins.	Water closets.	Stable faucets.	Urinals.	Stores in connection with other use.	Beer pumps.	Saloons in connection with other use.
Residences—1 apartment.	81	10	81	157	15	18	15	28	1	....	......	....	......
Residences—flats..........	11	....	14	35	....	1	....	2	....	....	1	....	......
Residences, with other uses in connection......	3	2	3	7	....	1	1	2	....	....	2	....	1
Photograph galleries.....	1	....	1	......	....	....	....	....	....	....	......	....	......
Parish school..............	1	....	1	......	....	....	....	....	....	....	......	....	......
Hallway....................	....	....	1	......	....	....	....	1	....	....	......	....	......
Cigar factory..............	1	....	1	......	....	....	....	....	....	....	......	....	......
Office......................	1	....	1	......	....	....	....	....	....	....	......	....	......
Store.......................	1	....	1	......	....	....	....	....	....	....	......	....	......
Saloons.....................	2	....	2	......	....	....	....	1	...	1	......	2	......

The next table shows the number and class of consumers and the number and nature of fixtures, where premises have actually been shut off, either because of the refusal of occupants or owners to pay for water or because of the premises becoming vacant:

SHUT-OFF PERMANENTLY.

	First faucets.	Additional faucets.	No. of cons.	No. of rooms above 5.	Hose.	Baths.	Wash basins.	Water closets.
Residence-1 apartment	32	1	32	51	2	5	3	7
Residence-1 flat........	3	....	4	8	....	....	....	....
Theater.................	1	....	1	....	....	....	....	1
Church	....	....	1	....	....	....	....	....

Consumers who are listed in the above table of those shut off permanently are those who were consumers at some time during 1910, but were shut off during that year.

The relatively large number of consumers whose shut-off notices had expired, brings up the question of who should be considered as active consumers in arriving at the basis for fixing rates in this case. Those consumers who are or have been delinquent in making payments for water used were carried on the books of the company as active consumers during 1910. Doubtless a large number of them will continue as patrons of the water company, despite the fact that it has been difficult to make collections from them. Before determining whether or not these should be listed as active users, it may be well to look into the relations between consumers and the utility. The two orders which have already been made by the Commission, as stated earlier in the decision, provided that until the final order should be entered in this matter, the company should accept, in payment for water supplied to private consumers, the amount which such consumers paid prior to Jan. 1, 1909. It appears, however, that bills have been rendered at the franchise rate. Then, in cases where prompt payment was not made, a further notice was sent to consumers, stating the amount which would be accepted on account, and that water would be shut off if such payments were not made within thirty days. The utility seems to have attempted to collect the franchise rate and to have taken advantage of the orders referred to only in cases where such collections could not be made.

This undoubtedly has been one element which has been responsible for the difficulty which has been experienced in making collections, but there appear to have been other causes as well. Prior to the time that the present manager took charge of the business, little or no system seems to have been employed in making collections. Bills were made out for a lump sum, and not itemized according to the nature and number of fixtures supplied, and prompt payment seems not to have been insisted upon. As a result of this, it is probably only natural that a great many consumers should fail to see the necessity for making prompt payment at the present time. The lack of any discount or other inducement to secure prompt payment has probably added to the difficulty of collection.

Aside from these causes which would be likely to operate in the case of any utility situated similarly to the applicant, part of the trouble seems to have been caused by the lack of harmony between consumers and management. Without attempting to fix the blame for this lack of harmony, we believe that, in some degree at least, this condition is responsible for the failure of consumers to pay promptly for service rendered. What effect this should have in the final determination of rates, may be a matter of dispute. If the blame could be clearly fixed upon the patrons of the water company, it might appear to be unfair to the utility to make any concession to consumers because of those conditions, and if the utility were found to be clearly and solely at fault, it would appear that the utility alone should bear the consequences. In practical operation, however, it may be impossible to work out any theories as to where the burden should be placed. This is especially true at Oconto, where patrons can, and frequently do, install private water supply systems rather than pay the charges demanded by the utility. In the present case the utility is in active, direct competition with private wells, and any theory as to the proper distribution of the burden caused by unharmonious relations between the utility and the public must give way to considerations of practicability. The reestablishment of satisfactory relations between the company and its patrons is a task which cannot always be successfully assumed by any third party. To the extent that the failure of the company to earn what would ordinarily constitute a reasonable return has been or is due to such unfortunate conditions, it seems that in practice the utility will have to bear the burden. This holds true in competitive business, and the applicant in this case, at least as far as a large number of its patrons are concerned, is engaged in a competitive undertaking, with private water supply systems as its competitors.

In the case of the 106 users of water whose shut-off notices had expired at the time that the consumer data were submitted to the Commission, it is only fair to suppose that, if water were actually shut off, the consumers in question would be supplied from other sources, presumably from private wells, although not necessarily from wells owned by the consumers in question. As far as consumers who have to be shut off for non-payment are concerned, it seems that the business of the utility is competitive. To this extent, then, the utility seems to be subject to the principles which apply to competitive business. If these consumers discontinue the use of the utility's product, it may be that rates should not be fixed at a point such that remaining consumers will pay the full cost of general service as determined previously in this decision. Not only might such a course be unfair in this case, but it might result disastrously to the company, as it would probably increase the number of consumers who would feel that they could dispense with the services of the utility and receive their supply from private wells rather than pay the increased prices for water. That is, under the circumstances existing in Oconto, such a course might merely increase the extent of competition and make it all the more difficult for the utility to secure an adequate return.

Counsel for the city pointed out what he considered the results of such a policy, arguing that if no consideration is given to the fact that a large portion of the general service can be supplied from private wells, many consumers will discontinue the service of the utility. If the rates are then made so as to provide that remaining consumers pay the costs of operation, and interest and depreciation upon a plant which is capable of supplying a much larger number of users, a further decrease of patronage would appear inevitable. Carried to its logical extreme, counsel maintains that this would involve a constant readjustment of rates and an equally constant decrease in the number of consumers, until the general business, at least as far as it is subject to competitive conditions, would be entirely lost. This points to the conclusion that in this case, for purposes of rate making, the total number of consumers supplied should be considered, even if a considerable portion of them are likely to discontinue the service, or be shut off for non-payment.

The total cost of supplying the general service, with interest on a 6 per cent basis, has been found to be $12,018.51, and with interest at 7 per cent this cost amounts to $12,549.65 per year. This is the cost of all service other than fire protection. For the year ending June 30, 1909, the total revenues, as charged, amounted to $9,342.63, exclusive of hydrant rentals, and for the following year, to $11,464.94, divided as follows:

Earnings from commercial sales.		
Flat	$9,864.38	
Metered	214.14	$10,078.52
Earnings from industrial sales.		
Flat	$1,335.68	
Metered	50.74	1,386.42
Total		$11,464.94

The revenues as shown above do not represent actual collections, but merely the amounts as charged in accordance with the franchise rates. Actual collections during the fiscal year 1909-1910 of revenue earned during that year, exclusive of hydrant rentals, appear to have been only $5.168.71. This amount does not include anything for water used for municipal purposes, such as street sprinkling, sewer flushing, use in public buildings, etc. For consumers who were active during the calendar year 1910, the revenues, as charged, were as follows:

Active Consumers

Residences—1 apartment	$4,976.00
Residences—flats	161.00
Saloons	812.50
Residences—with other uses	276.00
Halls, etc.	178.00
Stores	177.00
Offices	200.00
Livery barns	206.00
Barber shops	47.00
Hotels and boarding houses	271.00
Miscellaneous	403.00
Factories, mills, etc.	365.00
Metered services	420.85
Total—active consumers	$8,493.35

Shut-Off Notice Expired.

Residences—1 apartment	$792.00
Residences—with other uses	90.00
Residences—flats	80.00
Miscellaneous	108.00
Mills and factories	559.95
	$1,629.95

Aside from those consumers who have actually been shut off during 1910, the total amount of revenue, as charged, is thus $10,123.30. As consumers who were actually shut off, whether for non-payment or because of the vacation of the premises, have not been included, it seems that the total of $10,123.30 represents very nearly the actual earnings for a year if the full franchise rates were charged and collected. In addition to this amount a bill was rendered to the city for $20 for water used by a city stone crusher and for 3,320.4 feet of paving at 5 cts. per lineal foot, or $166.02. For street sprinkling, the water company attempted to charge 3 cts. per lineal foot for the season, but the city objected to this charge as excessive and the matter was finally settled by an agreement that the city should pay the old rate of $75 per mile per year until the final settlement of the case, or $130.50 for 1.74 miles, which appears to be the length of streets sprinkled. The company appears to have had no earnings from water used for general construction purposes.

The total of all revenue, other than that from hydrant rentals, then, appears to amount to $10,439.82 if revenues are actually collected according to the full franchise rates. This is more than $1,000 less than the total revenues as charged during the fiscal year 1909–1910, due largely to the dropping off of a considerable number of consumers as shown in tables earlier in this decision. As the cost of this service, on a 6 per cent interest basis, has been found to be $12,018.51 per year, and $12,549.76 on a 7 per cent interest basis, it is apparent that the argument of counsel for the city, that rates could be reduced 25 per cent and still leave a reasonable return for interest and profit, is not substantiated by the facts. On the other hand, it appears equally clear that rates cannot be fixed at a point such that the utility, with its present connected business, can earn a return of 7 per cent or even as high as 6 per cent. The applicant has contended, throughout, that it is entitled to earn a rate of 7 per cent, but apparently has overlooked the fact that, as conditions stand at present, it is a practical impossibility to obtain such a return under any schedule of rates. Undoubtedly the utility is entitled to a reasonable return upon the value of its property, whether that rate be fixed at 7 per cent or some other figure, but if the attempt to enforce rates which will yield such a return is to lead to a decrease in the number of consumers and resulting decrease in revenues, any theories as to the proper return on property must give way to the practical situation. As stated before, the utility is engaged in a competitive business, as far as its dealings with a large part of its private consumers are concerned, and it is apparent that the maximum charge for service will be fixed by the conditions of competition and may fall considerably below what the cost of the service amounts to. If the utility is to hold the business which it has connected, it seems that its rates must be determined not only by the cost to the utility of service rendered, but by other conditions as well. As shown above, a large number of consumers have already discontinued the service because they were unwilling to pay the amounts demanded by the utility, or the franchise rates. Considerable testimony was introduced to show that if rates fixed by this decision were as high as the franchise rates, still more of the present consumers would discontinue. That this would be the case, appears to be unquestionable. The fact that consumers will not pay a rate which will enable the utility to earn what would ordinarily constitute a reasonable rate of return upon its property, may not affect the justice of such a charge or the legal right of the utility to charge such rates, but the fact that the utility has a legal right to a reasonable return upon its property will not prove of much value if it loses a large part of its business because of the presence of competition or the inability of consumers to pay enough to ensure the company such a return.

In the light of these facts it seems to be evident that the total revenue from domestic and industrial users must be less than the total annual revenue as charged under the franchise rates, if the utility is to retain its present business, to say nothing of inducing former patrons to return, or of securing new business. At least the rates must be such that the cost of service to a large number of consumers will be reduced. Complaints regarding high rates, and the discontinuance of the service have not been confined to any one class of consumers. Reference to the lists published earlier in the decision, of consumers who have discontinued the use of water from the mains of the water company, shows that all classes of residence consumers are represented. A considerable number of these consumers would pay only the minimum rate of $5 per year, even under the franchise rates, while others would pay larger amounts. The discontinuance of the service of the water company has been by no means confined to consumers whose annual bills were relatively large. From this it would appear as difficult to increase the minimum charge as to increase the rate on fixtures which are used only by those who pay relatively large amounts. The manager of the utility expressed the opinion that, regardless of the cost of furnishing the service, not much more than $7,000 per year could be obtained from the consumers listed in the foregoing tables, and a study of the conditions in Oconto seems to indicate that this amount may not be far from correct. To make up the difference between this amount and the cost of general service, it was argued on behalf of the applicant that the charge to the city for fire protection should be increased to an amount greater than the actual cost of that service, as determined earlier in this decision.

This argument, however, does not appear to be sound. Unless there are reasons peculiar to the local situation why a departure from this policy appears reasonable and equitable, the city ought to pay the full cost of fire protection, but it does not seem to be fair to charge more for fire service than the cost of that service, including in the cost interest and depreciation on the proper share of the property. The water company is really carrying two distinct enterprises, even though portions of the equipment are used in common by the two. If a utility, for example, supplies both water and electric service, using portions of its equipment in common for the two branches of service, the inability of the utility to earn a reasonable and fair return upon either branch of the service would probably not justify an increase of rates for the other. The same would seem to be as true of a utility which furnishes fire service and general water service as of a utility supplying both water and electric current. The nature of the services rendered, the uses, and the conditions under which the product is delivered are as different as if they were rendered by two entirely separate utilities, or as if two entirely different products were delivered. This line of reasoning would seem to apply, at least under normal conditions. At any rate, while conditions in this case are in many respects out of the ordinary, we do not feel that they are such that at this time we can hold otherwise than as just outlined.

Of course, the cost of fire service is not the only cost which should be borne by the municipality, but it seems only fair that the fire service should not be burdened with a portion of the cost of general service. The city should pay for water used for other than protective purposes in the same way as an individual or a corporation would be expected and required to pay for a similar use. There appears to be no reason why a water supply company should be required to furnish water free to public buildings and schools, and for other public uses, and attempt to make up for this by additional charges to private consumers.

This being the case, the public uses of water for schools, public buildings and fountains, and for sewer flushing, street construction work and street sprinkling should be charged with and pay their share of the expenses of general service. Of those the use for flushing purposes, for street construction work, and for street sprinkling may be considered "off-peak." That is, these are uses of water which do not occur at times when the maximum demand, consisting of the demand of domestic and industrial users and the heaviest demand for fire purposes, is being exerted. These are, therefore, uses which do not greatly influence the required capacity of the plant, and may therefore be charged with less in the way of capacity expenses than other uses. Of course, if the city actually uses water for these purposes during the time of a large fire, the rate for water so used should include a portion of the capacity expenses. It appears to be only reasonable, however, to require the city to discontinue the use of water for these purposes during times of fire, and it would appear to be to the interest of the city to do so, as this makes the correct charge for the water used very much lower than it would otherwise be. If 125,000,000 gallons per year are delivered to consumers, the output costs of general service, which amount to a total of $6,443.07 on a 6 per cent interest basis and to $6,681.60 on a 7 per cent basis, are respectively 5.15 cts. and 5.32 cts. per 1,000 gallons. From this it appears that the charge for these "off-peak" uses should be approximately 5¼ cts. per 1,000 gallons used.

Assuming, for the moment, that the estimate of 4,000,000 gallons per year as the amount of water used for flushing sewers is correct, the revenue from the city for this use, if no part of capacity expenses is included, would be in the neighborhood of $210 per year.

The total amount of water used in connection with paving work appears to have been very nearly 375,000 gallons during 1910. This was used for building 3,320 feet of macadamized street, which indicates that the amount used was approximately 120 gallons per lineal foot. Considerable difficulty has been experienced in obtaining a reliable estimate of the amount of water used in connection with the construction of macadamized streets, as the estimates submitted by the company and by the city differ very materially. Neither does it follow that 120 gallons per lineal foot will be the amount used in the future. This is a use which can hardly be standardized. The amount used may vary a great deal from the estimate made here, but from such facts as are available, it seems that a rate of 1 ct. per lineal foot is substantially correct. This is a very considerable reduction from the charge made by the water company, but this fact does not affect the justice of the new rate.

For street sprinkling it seems that about 2,500,000 gallons are used annually by the city. At 5¼ cts. per 1,000 gallons, the cost of supplying this amount of water is $131.25. At $75 per mile the revenue from sprinkling service for 1¾ miles will be exactly $131.25. As it appears that very nearly 1¾ miles of streets are sprinkled, the present charge of $75 per mile needs no modification.

According to these estimates of the use of water, about 118,125,000 gallons per year are delivered to consumers who should bear their full share of the capacity expenses. These expenses for general service have been found to amount to $5,387.77 with interest at 6 per cent and to $5,680.49 with a 7 per cent interest rate. Direct consumer expenses amount to $187.67. These consumer expenses include only $2 per year for the maintenance of meters, which is relatively so small that the whole sum of $187.67 may be treated as consumer expenses which should be shared equally by all consumers. Figuring that the output cost per 1,000 gallons is 5¼ cts. or slightly less than the actual cost, using a 7 per cent interest basis, the total output expenses are $6,021.56 per year.

It becomes necessary in this case to fix both flat and meter rates, but the determination of meter rates is made very difficult by the fact that very few of the users of water are supplied on a meter basis. Owing to the almost exclusive use of the flat rate plan, there are no means of determining just what effect the introduction of meters will have upon the use of water. That there will be a very considerable decrease in the amount of water used, appears to be unquestionable, but the exact extent of such decrease is dependent so greatly upon the local conditions that it cannot be accurately foretold. Because of this, it is not possible to make a schedule of meter rates at the present time which will be likely to fit conditions very far in the future.

The consumer statistics submitted by the utility show that at the close of 1910 there were 707 service connections for consumers who were charged for water, beside the 19 connections for municipal purposes. The five standpipes have not been included in the number of service connections given above, because these standpipes are used only for the purpose of obtaining water for street sprinkling and for street construction purposes, both of which are off-peak uses. Of the 726 connections the sizes are as shown in the following summary. Where services are metered, a ⅝ inch meter is listed as a ¾ inch service.

Size.	Number.	Size.	Number.
6 inch........................	10	1 inch........................	6
2 "	4	¾ "	685
1½ "	4	½ "	16
2½ "	1	....	....

Capacity expenses have been found to be from $5,387.77 to $5,680.49 per year, depending upon whether a 6 per cent or a 7 per cent interest rate is used. As it appears to be evident that rates cannot at the present time be made for general service which can be expected to be permanent or which will yield the utility a return sufficient to meet the costs, it may be well to use, as a basis for rate making, a capacity expense of about $5,500 per year. This is aside from the consumer expense of $187.67 per year.

The next question is that of the apportionment of capacity expenses among the various consumers. This may best be done according to the size of service connection. Of course, it cannot be held that two consumers, both of whom are supplied with a ¾″ service pipe, will, under all conditions, make the same demand upon the plant. Distance from the pumping station, elevation, size of supply mains, and length of service, all have their effect upon a consumers' possible demand. In practice, however, it is impossible to make rates which shall be modified by all of these factors, so that it seems that the best basis for a division of capacity expenses is that of the size of service. Objection may be made to this basis of apportionment on the ground that, even if all other conditions are identical, the actual demands of two consumers will not be determined entirely by the size of service connection, but are influenced to a considerable degree by the number and nature of fixtures supplied. That is, it may be argued that a consumer whose premises are supplied through a ¾″ service pipe and a single faucet cannot make as large a demand as a consumer whose premises are supplied by a service pipe of the same size but with several faucets or fixtures supplied.

It is undoubtedly true that the demands of two such consumers are not the same, and yet the size of service connection appears to be a reasonable basis. If consumers are supplied on the flat rate plan, no accurate distribution of expenses as among consumers is practicable. In a general way, however, the rate per fixture takes account of the increased demand due to increased number of fixtures. The minimum charge under the flat rate plan for a single faucet may be somewhat less than the share which would be charged to that faucet if no allowance is made for the variation in demand according to number of fixtures, and still not be unjust. As long as the flat rate plan is used, the rate schedule, therefore, takes cognizance of variation in demand caused by influences other than the size of service connection, as far as it is practicable to take these factors into consideration at all. When meters are used, it is also true that the demand of any given consumer may not be the same as that of another consumer supplied through a meter of the same size. When meters are used, however, the utility has no interest in the number or nature of fixtures supplied. Under a flat rate plan the system of charging a certain amount per fixture leads to antagonism between the interests of the consumer and of the water company. The interest of the company is to have the greatest possible number of fixtures installed, while the consumers' interest is to keep the number of fixtures down to the lowest practicable point. When a meter is used, the interest of the company in the number of fixtures, except insofar as additional fixtures lead to increased use of water, ceases to exist. Neither is there any incentive, at least so far as their relations with the water company are concerned, for the consumers to keep down the number of fixtures.

For this reason it seems best in fixing meter rates to consider the demand to be the demand of the service pipe, or, better still, of the meter itself. That is, the demand should be taken as the demand of a meter of the size in use, leaving the fixtures out of consideration. The company has to be ready to meet the greatest demand which may be made through the meter in use, and it seems that the demand expenses should be apportioned with this in view. Under a flat rate plan, on the other hand, the company is interested primarily, not in the size of service, at least in the case of most of its consumers, but in the number of fixtures. Water is supplied to the fixtures individually and so charged for, and is not delivered to the premises and charged for as under the meter plan.

There may be conditions which will justify a departure from this method and under which some other plan of apportionment will be found superior, but for the present case, at least, the method as outlined above seems to be the best.

The making of rates for the applicant in this case is complicated because of the fact that there are two large lumber mills which have private fire protection systems connected with the mains of the water supply company. These are the Oconto Lumber Company and the Holt Lumber Company. To the

Holt Lumber Company's buildings and yards there are really only four six-inch connections, although the data submitted by the water company show that there are eight such connections. This company has notified the water company of its intention to discontinue the use of its service. Owing to the fact, however, that there has been a disagreement as to the proper charge against the lumber company for service already rendered, it becomes necessary to determine what are equitable rates for such service.

The water company's report shows that there are four six-inch connections to the sprinkler system in the planing mill of the Holt Lumber Company and two six-inch connections to the saw mill. These connections, however, are made from an eight-inch main of the water company by two six-inch services, so that instead of six six-inch connections to this part of the system, as listed, there are in reality only two. One six-inch connection supplies hydrants only. The water company's report also shows a six-inch connection to the shingle mill of the Holt company. This six-inch connection extends from the mains of the water company to a hydrant and 2½-inch standpipe owned by the lumber company, and from this point a four-inch service extends into the shingle mill, supplying the sprinkler system and such water as is used for other purposes in the mill. There seems to be some dispute as to whether the service pipe leading to the shingle mill is six inches or four inches in diameter up to the point where it connects with the fire hydrant, but from there to the mill it is a four-inch service.

The premises of the Oconto Lumber Company are supplied with water from mains on Bridge street and Farnsworth avenue. From Bridge street a six-inch pipe leads to a hydrant upon the property of the lumber company, from which point a 2½-inch service supplies the saw mill. From Farnsworth avenue a 1½-inch pipe supplies water for the planing mill. The data submitted by the water company indicate that the Oconto Lumber Company has two six-inch connections to the mains of the water company, but a more complete examination shows that there is but one such connection, and that this is reduced to 2½ inches in diameter after supplying the fire hydrant.

Excluding services which supply hydrants, we find the number and sizes of service connections to the water company's mains to be as follows:

Size.	Number.	Size.	Number.
6 inch	2	1½ inch	5
4 "	1	1 "	6
2½ "	2	¾ "	685
2 "	4	½ "	16

In this summary, where a service pipe supplies a private hydrant and extends into a mill, the diameter of the service which extends from hydrant to mill has been used. The effect of this, of course, is to furnish a basis for apportioning demand expenses which does not take into consideration the demand which may be exerted through private fire hydrants. This is included in the total fire demand of the city, which was the basis upon which the total cost of fire protection, as shown earlier in this decision, was based.

The practice of charging for fire protection according to the number of hydrants, or at a given rate per hydrant, regardless of other factors, has led to a great deal of confusion and misunderstanding. The cost of furnishing fire protection bears little relation to the number of hydrants. To be sure, where it is the practice to place hydrants at stated intervals as extensions are made in the distribution system, there is to some extent a relation between number of hydrants and cost of fire protection. The greater part of this cost, however, is not due to the fact that hydrants are actually installed. For example, if it were the practice to place hydrants at 200 foot intervals instead of 400 feet apart, the additional cost of fire protection would practically all be represented by the amount of interest and depreciation upon the hydrants themselves and their connections. No more water would be used for fire protection merely because hydrants were placed closer together. Neither would the demand upon the pumping station be increased because of this fact. The demand upon the station is practically independent of the number of hydrants.

There is a certain part of the city of Oconto to which fire protection is furnished from hydrants installed upon the existing distribution systems. The demand upon the pumping station, due to the fire protection system, is determined by the fire risks in the district protected. This demand is expressed in terms of the number of fire streams of a certain diameter and pressure necessary to furnish adequate protection. If the number of hydrants were doubled, the number of fire streams needed would remain the same, and the demand upon the station would consequently be unchanged. As the demand would remain the same, there would be no necessity for additional investment in pumping station or in distribution system, except for the cost of additional hydrants themselves.

From these facts it is obvious that, other conditions remaining the same, the cost of fire protection bears but a very slight relation to the number of hydrants. The fire demand, which, in turn, determines very largely what investment is required for purposes of furnishing fire protection, is not made by the hydrants themselves, but by the district to be protected, and consequently the interest, depreciation, taxes, and capacity expenses are dependent upon the fire demand and not upon the number of fixtures through which the demand may be exercised.

This does not mean that extensions of the fire protection system into new districts do not have an influence upon the cost of fire protection. If the distribution system is extended into a district to which fire protection had not previously been furnished, the total fire demand of the entire community to which protection is furnished is increased, because protection is supplied to an enlarged area. It should be borne in mind, however, that even in such cases the demand, and consequently the expenses, are not occasioned by the number of hydrants, but by the fire risk of the new district to be protected. Where it is the practice to install hydrants at stated intervals, it is, of course, possible to make a rate per hydrant which answers the purpose.

In general it may be said that where fire protection is already furnished to a certain district, the installation of additional hydrants within that district will not affect the cost of fire protection, except by the amount of interest, depreciation and taxes on additional hydrants installed. Where new districts are protected the cost of protection is increased, but because there is a greater risk and a consequently greater fire demand and not because there are additional hydrants placed upon such extensions.

This brings up the question of the justice of a charge for hydrants placed upon private property within the fire protection limits of a city. It is generally admitted that one of the functions of a city is to furnish adequate fire protection to buildings and structures within its limits. The fire demand is the demand which may be made upon the pumping station in furnishing this degree of protection. For furnishing this protection a private water company is under obligations only to the city. Really the city furnishes fire protection and the water company delivers water under pressure, to enable the city to fulfill its obligation to furnish protection. If a water company furnishes fire protection for private systems, to that extent it carries on a municipal function.

But aside from any theory as to the proper field of activity of the city and the water company, the argument appears conclusive that there is little or no basis in the cost of service principle on which a charge to a private concern for hydrants supplied with water for private fire protection may be justified, provided that the installation of these hydrants is made at the expense of the concern to be protected.

If the city furnishes adequate protection, for example, to a lumber yard, allowance is made for the fact that such protection is furnished when the entire fire demand of the city is determined. If the owners of the yard then decide to put additional hydrants into the yard, the total demand upon the pumping station is not increased by that fact, and consequently the expenses of the water company are not increased any more than the demand of the entire city and the expenses of the water company would be increased by doubling the number of hydrants on a business street, when the present installation is sufficient to give adequate protection.

If protection given by the city to a private concern, in the form of protection through fire hydrants, is not adequate, the concern in question will be unable to secure water enough to meet its fire demand. In such a case the total apparent fire demand upon the water plant will fall short of the total as it would be with adequate protection by the amount by which the private concern is unable to exercise its full demand, and the cost to the utility of furnishing such inadequate protection will be less than the cost of supplying adequate protection. Therefore, in case the city fails to furnish adequate protection, the installation of a private hydrant system, enabling the concern to secure adequate protection, will increase the costs to the utility up to the point where sufficient protection is furnished to meet the fire demand of the concern in question. The cost to the utility will, however, be the same whether such adequate protection is furnished by the city or by a system of private hydrants. In view of the fact that it is a recognized function of a city to furnish reasonably adequate fire protection, it seems clear that, as far as the water utility is concerned, the city should be the only party to pay for hydrant fire protection. The mere fact that a city fails to fulfill its duty of supplying adequate fire protection to buildings and structures within its limits, does not justify the water utility in making a charge against a private concern because that concern has installed hydrants which enable it to secure adequate protection. The fire demand of the city must be taken as a unit, and this can only be done when the city itself is the only party to whom the utility sells water under pressure for fire protection.

Let us assume a case of a city of 6,000 or 7,000 inhabitants, with a fire demand of eight fire streams. This demand of eight streams is not the sum of all the individual fire demands, but the demand which the utility must be prepared to meet in order to furnish protection to the city as a whole. In such a city there may be, aside from residences, stores, etc., a number of manufacturing plants, such as lumber mills, each of which may exert a demand equal to four or five fire streams. If we assume that there are four lumber mills, each with a demand of four fire streams, which have private hydrants and mains connected with the water company's mains, the demand of each of the four mills is half as great as the total fire demand of the city. Then, if the fire protection system of each of these mills is to be charged separately for water under pressure for fire protection, it would appear that the demand of each mill should be considered by itself, which would mean that each mill should bear half as much of the capacity expenses as are borne by the city, even though each mill constitutes a very much smaller part than one-half of the total fire risk of the city. Obviously, this would be unjust to the mills. The only alternative, however, seems to be to consider the fire demand of the city as a unit. In other words, the hydrant fire demand which the utility has to meet should apparently be regarded as the demand of the city itself and charges for hydrant protection assessed against the city itself. Any other method of charging, if logically carried out, must regard the demand of the private consumer, even though it may never be exerted, in the same light as that of the city as a whole.

In the light of these facts it seems incontrovertible that a charge should be made against the city and against the city only, sufficient to meet the cost occasioned by the fire demand of the city as a whole, and that there should be no charge for private hydrant fire protection. To be sure, a private concern may put in a larger number of hydrants than the city would have installed. It should be remembered, however, that the city should give adequate protection. If a private concern puts in more hydrants than are necessary to furnish such protection, the concern can make no greater demand upon the utility by virtue of that fact. Neither will it use any more water for fire protection. Consequently, since a city is bound to furnish adequate protection, and since additional hydrants beyond the number absolutely necessary to furnish adequate protection do not add to the expenses of the utility, it follows that the city should pay all of the cost of fire protection through hydrants and there should be no charge for private fire hydrants.

With regard to inside fire protection, such as automatic sprinkler systems, the charge directly to the property protected may be justified. It is not ordinarily regarded as being the duty of a city to furnish inside fire protection, but, aside from any theories as to the city's obligations, the charge for such protection appears to be in accord with the cost of service principle. The demand which may be made by an automatic sprinkler system is entirely apart from either the domestic demand or that of the hydrant system. From the very nature of the service it is likely to occur at the same time as the ordinary fire demand. When an automatic sprinkler system is in use, the water works must have a capacity equal to the combined domestic and hydrant demands, with sufficient leeway to take care of sprinkler systems. This is especially true in case of fire destroying a building equipped with sprinklers, where the pipe supplying sprinklers is likely to be broken, yet the water works must be capable of supplying its other service, even with the waste through broken connections. It is true that the installation of a single sprinkler system might not affect the required capacity of the plant and the investment, but any general introduction of such systems would certainly require an increased station capacity. Investment and operating expenses are directly affected by such sprinkler systems, which indicates that inside fire protection is a class of service which should be charged for independently of other classes, and charged directly to parties served.

The apportionment of expenses as between fire and general service, which is given earlier in this decision, includes under the head of fire protection only such protection as is furnished through hydrants. Consequently, the amount arrived at as due to fire service is the cost of hydrant fire service only, but includes the cost of all such service, whether rendered through hydrants owned by the utility or through those owned by private parties.

There may be objection to charging all of the cost of hydrant fire service to the city, on the ground that the parties receiving fire protection through privately owned hydrants are not paying enough to the city in return for the protection, but if this is the case, we believe that it is a matter which should be settled between the city and the private parties. It seems to be well established that the city should pay for all such fire protection, and the relations between the private parties and the city do not affect the justice of such a method of charging. From the argument as outlined above, it appears that in making rates for service to be rendered in the future little or no consideration should be given to private hydrants. What may be called "outside" fire protection, or such protection as should be furnished through hydrants, should generally be furnished by the city. The water company merely sells its service to the city and the city, in turn, furnishes fire protection. The city should, as a rule, pay the entire cost of such service, and the utility should not be allowed to sell service of the same kind to private parties, if by so doing it may produce a condition such that it may be unable to meet the demands of the city.

The use of water by the two lumber mills is such, that to make a flat rate which shall be even approximately correct, is a practical impossibility. Only one of these mills is to continue to use the service of the utility and by metering one 2½-inch pipe and one 1½-inch pipe all water actually used by this mill can be measured, and the only rate which need be applied in the future is the regular meter rate, as fixed by this decision.

According to the two orders which have been made in this case, however, it becomes necessary to make a flat rate for this class of service which shall apply from Jan. 1, 1909, until the time that the meter rates as fixed by this decision go into effect, unless the service is discontinued before that time. The nature of service for which water is supplied to these mills, together with the rates applied at present, are as follows:

OCONTO COMPANY.

Saw mill:

3 2″ hose connections, $20 each	$60.00
Drinking water for mill	30.00
Water for washing boilers, 7 at $10 each	70.00
3 saw coolers at $15 each	45.00
2 journal coolers at $25 each	50.00
Drinking water for machine shop	10.00
“ “ “ carpenter “	5.00
	$270.00
1 hydrant in yard	30.00
Total	$300.00

Planing mill:

1 1½″ pipe and hose valve in boiler room.	
Water for washing boiler, 2 at $15 each	$30.00
Fire protection	15.00
Drinking purposes	20.00
Total	$65.00

HOLT COMPANY.

Saw mill:

2 6″ connections.	
1 standpipe, drinking	$40.00
3 “ fire protection	45.00
Sprinkler heads, 385 at 7 cts. each	26.95
Washing boilers, 7 at $10 each	70.00
1 hydrant in yard	30.00
Total	$211.95

Planing mill:

1 hydrant in yard	$75.00
295 sprinkler heads at 7 cts. each	20.65
Total	$95.65

Lumberyard:

7 hydrants at $30.00	$210.00

Shingle mill:

1 2½″ standpipe near hydrant	$15.00
1 fire hydrant	30.00
105 sprinkler heads at 7 cts. each	7.35
1 2″ hose connection used for washing boiler and fire protection, 2 boilers at $10	20.00
Total	$72.35

The total charge to the Oconto Lumber Company is thus $365, as against $150 prior to Jan. 1, 1909. The total annual bill of the Holt Lumber Company is $589.95 under the present rates, and prior to 1909 the amount was $375 per year. These amounts do not include the charges for water used in stables, boarding houses, etc., belonging to these companies, which should be subject to the regular rates for such service.

The two orders of the Commission which were referred to above, provide that the rates as fixed by this decision shall be in force from Jan. 1, 1909, only as applied to the private consumers. This being the case, no change can be made in the charge to the city for fire protection for the period from Jan. 1, 1909, to the date of this decision, from the charge which had previously been made. The city appears to have furnished protection, for one of these mills at least, which could hardly be regarded as adequate, and it may be in this case that the private hydrants installed did have an effect upon the total fire demand. In such a case, if the city did not furnish adequate protection and the lumber company found it necessary to put in a system of mains and hydrants at its own expense, the water company should be reimbursed for the additional expenses, and as long as this is fire protection not provided for in the franchise which determined the amount to be paid by the city for its protection, it appears to be only reasonable that the lumber company should pay the cost of this service until the charge to the city is changed by this decision.

An examination of the uses to which water is put in the plants in question makes it evident that no estimate of the amount of water used can be made with even an approximation to accuracy. It is impossible to arrive at any figure which is at all likely to represent the amount of water used, and it is useless to attempt a guess at the amount. Of course, the result of this is that no flat rate can be made for this service which would be likely to stand the test of actual metering of water used. It is probable that neither the rate in use before 1909 nor the one charged since that time is correct, but there is no way of determining what a correct flat rate would be. In the case of one of the lumber companies there is a dispute regarding the amount of water used, the lumber company contending that it used practically no water from the mains of the water company, while the utility maintains that a great deal was so used. The proper charge from Jan. 1, 1909, to the date on which the meter rates shall be applied or the service discontinued, should be sufficient to cover the demand expenses occasioned by or chargeable to these plants, and an amount sufficient to pay for the water used, if that amount could be found. As it is not possible to make a flat rate for this service which will be correct, it seems best to leave the rates for this service the same as they were before 1909, until meter rates can be substituted or until the service is discontinued. Meters should be installed at the earliest possible date. The outside fire protection furnished to these mills will hereafter be paid for by the city, and the rest of the service will be paid for at meter rates. It does not appear necessary to fix a rate for sprinkling systems at this time, as the only sprinkler system connected is that of one of the lumber mills which is to be disconnected.

There are also many uses of water for which the franchise does not prescribe the rate to be applied, but merely states that the rate for these classes of service shall be special. For example, there are steam boilers, brick yards, public water closets, and storage and shops. It appears to have been the practice for the water company to make special rates depending upon the size of buildings or fixtures supplied and upon their probable use of water. No single rate seems to have been applied to all boilers, or to all shops, etc. In such a case no uniform flat rate can be fixed which will be just to all consumers. This situation has arisen because of incorrect methods of charging applied by those who formerly had charge of the utility, and it seems that the best practicable means of dealing with this situation will be to leave all special rates as they were before 1909, until meters can be installed and then to supply all such consumers through meters. There are also a number of classes, such as saloons, restaurants, and lodges, for which the rates as prescribed by franchise vary within rather wide limits, it apparently having been the intention to allow the water company to adjust the charge within these limits to fit the use made by any individual consumer. There appears to be no reason why these should not be treated in the same manner as uses for which no rate was fixed by franchise.

By far the largest class of users are the residence consumers, there being 615 services supplying residences, although in a few cases there are other uses in connection. The following table gives a comparison of the rates for residence use in a number of cities in Wisconsin, including Oconto:

WISCONSIN WATER RATES.

City.	6 rooms or kitchen.	Wash basin.	Laundry tubs.	Bath.	Water closet.
1	$5 00	$1 50	$4 00	$3 00	$3 00
2	6 00	1 00	2 00	3 00	2 00
3	6 00			5 00	4 00
4	5 00		2 00	2 00	3 00
5	6 00			2 00	4 00
6	5 00			3 00	2 50
7	5 75			4 00	4 00
8	6 00			4 00	4 00
9	6 00	3 00	3 00	5 00	5 00
10	8 00	2 00	2 00	2 00	3 00
11	6 00	2 00		4 00	4 00
12	4 00			2 00	2 00
13	6 40	3 20		4 00	4 00
14	7 00			5 00	5 00
15	6 00	3 00		3 00	4 00
16	6 00	50		4 00	4 00
17	6 50	1 50	4 00	3 00	3 00
18	9 00			5 00	4 00
19	5 00	2 00	4 00	2 00	2 00
20	6 80	2 00		4 00	4 00
21	6 00	2 00	4 00	4 00	4 00
22	8 00	2 00		5 00	4 00
23	6 00	2 00		4 00	4 00
24	7 00			3 00	4 00
25	6 00	3 00		5 00	4 00
26	4 80	1 80		3 60	4 00
Average	6 12	2 03	3 12	3 60	3 63
Oconto	6 00	2 00	2 00	4 00	5 00

As far as a comparison of rates can be accepted as an index of reasonableness, the rates for residence use in Oconto appear to reasonable, with the possible exception of the rates for baths and water closets. Of course, the very fact that conditions are greatly different in various cities minimizes the value of such a comparison. As repeatedly pointed out in this decision, however, it seems to be an established fact that the applicant cannot maintain its rates for household uses of water at their present point and retain its connected business, even though the total revenue resulting from the application of those rates is less than needed to provide an adequate return on the property. Just what the extent of the reduction should be, may be questionable, but it seems that if the rate per bath is fixed at $3.50 and per water closet at $4.00 per year, the gross rates will be reduced about as much as conditions will warrant.

Much of the trouble encountered by the water company has been due to the difficulty of making collections. If a suitable discount is offered for prompt payment, the net charge to consumers will be appreciably reduced at the same time that the company will be aided in securing prompt payment. A discount of about 10 per cent for payment during the first month of the quarter would seem to afford consumers as great a reduction from present rates as warranted by existing conditions. This will reduce the revenues of the utility to some extent, but the best interests of the company seem to necessitate some such action if its general business is to be kept up, at least until conditions reach a normal level so that a permanent adjustment can be made.

Any meter rate which is made at this time will be likely to need revision within a very few years, as the number of meters in use increases. In addition to the expenses of the utility at present, the introduction of meters would increase the expense by the amount of interest and depreciation on the meters, maintenance of meters and meter reading. What the expenses of meter reading and maintenance will be, cannot be stated accurately but if an allowance of 40 cts. per meter per year is made for this purpose, it is probable that the results will be satisfactory. The next table shows the value of meters of different sizes, and the amount of interest and depreciation, meter maintenance, and reading costs:

Size of meter.	Value of meter.	Interest and depreciation per meter.	Maintenance and reading, per meter.	Total meter costs. per meter.
⅝	$12 40	$1 49	$0.40	$1 89
¾	21 60	2 59	.40	2 99
1	30 80	3 70	.40	4 10
1½	50 00	6 00	.40	6 40
2	65 00	7 80	.40	8 20
3	135 00	16 20	.40	16 60
4	160 00	19 20	.40	19 60

The cost of maintenance may be over the amount included here for large size meters, but in the absence of definite information concerning the costs in Oconto, it appears best to use the amounts listed in the table above. Where it is necessary to set meters in pits, the cost of the meters will be higher than the figure listed above, but it does not seem that it will be necessary to place any considerable number of meters in pits.

As there are no data by which the amounts used by various classes of consumers in Oconto can be determined, it is not practicable to make a meter rate which will be likely to conform very closely to the cost curve. Meters should be installed in all cases where the franchise prescribes that the rate shall be a special one or where it is not definitely fixed by the franchise, and especially where water motors are used. This will result in metering those consumers whose uses of water are such that no flat rate can be made of general application, because of the uncertainty as to what is a reasonable use of water. This same condition makes it impossible for us to determine how much water is likely to be used by these consumers when they are metered. If the meter rate is made up as shown below, it is believed that both the consumers and the utility will be equitably dealt with:

Service charge:

Size of meter	Quarterly charge
⅝ inch	$1.00
¾ “	1.50
1 “	2.00
1½ “	2.50
2 “	3.00
3 “	5.00
4 “	7.00

Charge for water used:

For the first 10,000 gallons per quarter, 20 cts. per 1,000 gallons.
For the next 15,000 gallons per quarter, 15 cts. per 1,000 gallons.

10 cts. per thousand gallons for all over 25,000 gallons per quarter. 10 per cent discount for payment within one month after the end of the quarter. This meter rate amounts to a reduction from the schedule now in effect, as great a reduction as it appears safe to make at this time. When the utility has had meters installed for some time, so that the uses of water can be analyzed, any necessary adjustment may then be made.

For construction work, other than pavement construction, the rates are as follows:

Brickwork, per 1000 laid	$0.10
Plastering, per 100 sq. yds.	.25
Stone work, per perch	.07
Cement sidewalks, 4 in. thick, per 25 sq. ft.	.05
Cement crossings, 8 in. thick, per 25 sq. ft.	.10
Concrete walls, 100 cu. ft.	.60

Owing to the probability of wasteful use of water in connection with construction work, it does not appear practicable to make a rate for these uses which shall cover merely the value of the amount of water necessary, but the present rates are unquestionably much too high. Even with a liberal allowance for waste, it seems that these rates should be materially lowered. A great deal depends upon the care taken in the use of water, but the rates as fixed in the order following appear reasonable.

The rates as here fixed may, as stated, be found to need revision after a trial, in which case the Commission can undertake to make such revision as seems necessary. When meters are installed as ordered in this decision and the plant operated for some time under the rates herein ordered, such revision can be made as will correct any defects in the rates as here fixed. The schedule outlined in the order, however, as far as rates may be determined at this time, appear to be reasonable. They will not yield the utility a very large return on its investment, even with operating expenses reduced by adjustments such as have been made. The total revenue under the flat rates, as outlined here, will be about as follows:

Fire protection and sewer flushing	$9,800.00
Street sprinkling	130.50
Commercial and industrial, net—if all consumers continue the use of water	8,900.00
Construction and miscellaneous—about	200.00
	$19,030.50

As the operating expenses, exclusive of any provision for interest and depreciation, were found to be a little over $12,600 per year, it is evident that only about $6,430 per year, as a maximum, or 5.14 per cent of the value of the property, will be available for interest and depreciation. Even this return is based on the assumption that all consumers will continue as patrons. As a matter of fact a number have already discontinued, so that it is safe to say that the return which the utility will receive for interest and depreciation will hardly exceed 5 per cent at the most. Metering the few consumers who are ordered metered by this decision will affect the total revenues only slightly.

IT IS THEREFORE ORDERED. That the applicant in this case. the Oconto City Water Supply Company, discontinue its present rate schedule and substitute for it the following schedule:

Where rates are definitely fixed by the franchise, the flat rates to be applied, until further revision may be made by the Commission, shall be the present rates which are the rates fixed by the franchise, except that bath tubs and water closets in residences shall be rated at $3.50 and $4.00 per year, respectively. From Jan. 1, 1909, until the time that this order takes effect charges shall be made according to the net rates fixed above.

Where the present rates as indicated in the franchise are special, or where they are not definitely fixed, and in all cases where motors are used, the charge for service rendered since Jan. 1, 1909, shall be the same as that made before that date. All such services shall be metered within six months from the date of this order at the expense of the water company. All public buildings and schools shall be metered and service charged for at the regular meter rates. Meter rates shall be as follows:

Service charge:

Size of meter		Quarterly charge
⅝ inch		$1.00
¾	"	1.50
1	"	2.00
1½	"	2.50
2	"	3.00
3	"	5.00
4	"	7.00

Charge for water:

For the first 10,000 gallons per quarter, 20 cents per thousand gallons.

For the next 15,000 gallons per quarter, 15 cents per thousand gallons.

10 cents per thousand gallons for all over 25,000 gallons per quarter.

There shall be no charge for private fire hydrants.

Water for construction purposes shall be charged for as follows:

Macadam paving per lineal foot	$0.01
Brick work per 1000 laid	.03
Plastering, per 100 sq. yds.	.10
Stone work, per perch	.03
Cement sidewalks, 4 in. thick, per 25 sq. ft.	.02
Cement crosswalks, 8 in. thick, per 25 sq. ft.	.04
Concrete in buildings, per 100 cu. ft.	.10

The charge to the city for fire protection and sewer flushing shall be $9,800 per year. The charge for street sprinkling shall be $75.00 per mile per season.

Where consumers who will not be supplied through meters under this order desire to purchase water at meter rates, they shall have the right to install meters at their own expense and pay the regular meter rates. The type of meter and the location and the manner of placing shall be subject to the approval of the water company, and the company shall have the same rights of access to the meters and of testing as if they were owned by the utility. The utility shall have the right to meter any service, but in such cases shall install the meter at its own expense.

There shall be a 10 per cent discount for payment within the first month of the quarter of all bills for domestic, commercial, or industrial sales.

IN RE APPLICATION OF THE PEOPLES WATER, LIGHT & POWER COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE FURNISHING OF WATER IN THE CITY OF MELLEN.

Submitted May 26, 1911. Decided Aug. 9, 1911.

Petition for a certificate of public convenience and necessity dismissed, for the reason that the applicant purchased the existing plant.

Under date of May 6, 1911, the petitioner, a corporation of the state of Wisconsin, applied to the Commission for a certificate of public convenience and necessity for the production, transmission, delivery and furnishing of pure and wholesome water, and adequate for fire protection, to the city of Mellen. The petition sets forth that the quality of water now being furnished to the city of Mellen is unfit for many domestic uses and is a great menace to the health and welfare of the citizens of such city, and that fire protection has not always been adequate; that on divers and sundry dates hearings have been held before this Commission when all parties appeared before the Commission and all sides of the controversy between the city of Mellen and its citizens and the Mellen Water & Light Company were heard; that notwithstanding such proceedings numerous misunderstandings have arisen between the parties interested, with the result that the conditions complained of have not been remedied; that public convenience and necessity require a second public utility for the production, transmission, delivery and furnishing of water in the city of Mellen. Wherefore, petitioner prays for such order, judgment or relief as to the Commission may seem just and equitable in the premises.

Hearing was held in the city hall in the city of Mellen on May 25 and 26. The petitioner was represented by *Frank E. Lamoreaux,* the Mellen Water & Light Company by *George E. McDonald,* and the city of Mellen by its attorney, *T. A. Humphrey.*

Subsequent to the hearing, the parties interested in the controversy made and entered into an agreement whereby the Mellen

Water & Light Company conveyed to the said People's Water, Light & Power Company its entire water distribution system, including the good will of the business and the right to furnish water either to the public or to private consumers in the city of Mellen. The common council of the city of Mellen, by the passage of a resolution dated July 5, 1911, confirmed and ratified the settlement so far as said city was interested.

Wherefore, in view of the above facts, the petition is dismissed.

BROWN LAND AND LUMBER COMPANY,
vs.
MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY,
MARINETTE, TOMAHAWK AND WESTERN RAILWAY COMPANY.

Decided Aug. 9, 1911.

Petition for refund on shipment of car of lumber from Goodman to Tomahawk, Wis. The rate contended for was agreed upon prior to the shipment and was subsequently made effective.
Held: **That the rate exacted was unusual and exorbitant and refund ordered.**

Petitioner is a corporation engaged in the lumber business at Rhinelander, Wis. It alleges that on April 10, 1911, it shipped a carload of lumber from Goodman, Wis., to Tomahawk, Wis., consigned to the Tomahawk Box Company; that such shipment was made with the understanding that the first above named respondent would protect a manufacturer's rate of 6 cts. per 100 lbs., but through a misunderstanding relative to the necessity of allowing thirty days to elapse before such rate would become effective, shipment was made at once, and as a result petitioner was obliged to pay the local rate of 10 cts. per 100 lbs., making the freight amount to $68.30; that the rate of 6 cts., which subsequently became effective and is now effective, would have made the charge $40.98, or the sum of $27.32 less than the amount that was actually exacted of the petitioner. Wherefore, the petitioner prays that the respondents be authorized to refund to it the said excessive charge.

The Minneapolis, St. Paul & Sault Ste. Marie Railway Company, answering the petition herein, alleges that it has no knowledge or information as to the petitioner's misunderstanding regarding the time when the 6 ct. rate would become effective, and that inasmuch as the original way bill is not yet on file, its record covers such shipment only as far as Bradley, Wis., to which point an 8 ct. rate was charged. It admits that a tariff naming a 6 ct. rate became effective April 29, 1911, but alleges that such shipment moved before the reduced rate took effect.

The respondent, the Marinette, Tomahawk & Western Railway Company, did not appear.

The claim was submitted upon the papers, pleadings and documents on file.

The traffic manager of the respondent railway company first named states that the rate of 6 cts. was agreed upon by the railway company with the petitioner before the shipment was made, and that such rate was considered by the petitioner in making the sale. In consequence, he advises that the rate of 6 cts. should be protected.

The overcharge here involved is admittedly due to the oversight of the petitioner and not to any action on the part of the- respondent railway companies. Nevertheless, the charge exacted is excessive when compared with the rate subsequently put into effect. The latter rate yields reasonable compensation to the carriers for the service rendered.

We therefore find and determine that the rate of 10 cts. per 100 lbs., exacted of the petitioner by the respondents for the aforesaid shipment of one car of lumber from Goodman to Tomahawk, Wis., on April 10, 1911, is unusual and exorbitant, and that the reasonable charge for such service would have been the rate of 6 cts. per 100 lbs.

Now, THEREFORE, IT IS ORDERED, That the Minneapolis, St. Paul & Sault Ste. Marie Railway Company and the Marinette, Tomahawk & Western Railway Company be and the same are hereby authorized and directed to refund to the petitioner, the Brown Land & Lumber Company, the aforesaid sum of $27.32.

MINERAL POINT ZINC COMPANY
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY, CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY, MINERAL POINT AND NORTHERN RAILWAY COMPANY.

Submitted May 10, 1911. Decided Aug. 11, 1911.

Petition for joint rates on zinc ore. Such rates were in effect and were canceled, and respondent proposed to further change and increase the rates, effective April 15, 1911. The effectiveness of this change was stayed by the Commission pending a decision on this petition. From comparisons made, it is shown that the rates complained of are materially higher than those in effect in zinc ore producing sections in other states.

Held: That the comparatively low value of this ore, the regularity of the movement, the freedom from damage in transit, the adaptability to almost any kind of railway equipment, the heavy loading per car, and the relatively low cost per unit of traffic, entitle it to a comparatively low rate. That a terminal charge of 60 cts. per ton and a movement charge of 6 mills per ton-mile will cover the proportion this traffic should bear of the operating expenses and returns on the investment. Joint rates are ordered on this basis.

The petitioner, a corporation engaged in mining zinc ore and manufacturing zinc products, seeks the establishment of joint rates on shipments from certain Wisconsin mining points over the lines of the respondent railway companies to Mineral Point, Wis., where the petitioner's separator plant is located.

As against the Chicago & North Western and Chicago, Milwaukee & St. Paul railway companies, it alleges in its complaint that these railways formerly had in force joint rates from the mining points in question, ranging from 4¼ to 4¾ cts. per 100 lbs., which rates were later made uniform from all such points at 4¾ cts., but that such joint rates were canceled June 1, 1909, making it necessary since that date for the petitioner to pay the sum of the Wisconsin distance tariff class E rate on the Chicago & North Western line from the point of origin to Platteville, and the local commodity rate of 2 cts. per 100 lbs.

on the Chicago, Milwaukee & St. Paul line from Platteville to Mineral Point. The result of this change is shown by the tabulation in the complaint, substantially as follows:

From C. & N. W. stations.	Former joint rate, cts.	PRESENT RATE, CTS. PER 100 LBS.			
		C. & N. W. to Platteville.		C. M. & St. P. Platteville to Mineral Point.	Total rate to Mineral Point.
		Miles.	Class E rate.		
Hazel Green	4.75	22.2	4	2	6
Buncombe	4.75	18.9	3.8	2	5.8
Strawbridge	4.75	17.1	3.8	2	5.8
Benton	4.75	14.9	3.4	2	5.4
Cuba City	4.75	11.4	3.4	2	5.4
Elmo	4.75	8.7	3	2	5
Rewey	4.75	15.4	3.4	2	5.4
Livingston	4.75	20.2	3.8	2	5.8
Montfort	4.75	26.1	4	2	6

As against the Chicago & North Western and Mineral Point & Northern railway companies, the petition alleges that these two lines formerly had in effect a joint rate of 4¾ cts. per 100 lbs. from the mining points herein involved to Mineral Point, but that this rate was canceled Oct. 31, 1908, and in place thereof were substituted the Wisconsin distance tariff class E rates, the distances being based upon the combined haul over the two lines. The result of this change is shown in the following tabulation:

From C. & N. W. stations.	Former joint rate, cts.	PRESENT RATE, CTS. PER 100 LBS.			
		Mileage.			Rate. Wis. distance tariff class E.
		C. & N. W., origin to Whitson Jct.	M. P. & N. Whitson Jct. to Mineral Point.	Combined mileage.	
Dodgeville	4.75	10	22	32	4.5
Edmund	4.75	1.9	22	23.9	4.0
Cobb	4.75	1.5	22	23.5	4.0
Montfort	4.75	6	22	28	4.0
Livingston	4.75	11	22	33	4.5
Rewey	4.75	16	22	38	4.5
Ipswich	4.75	27	22	49	5.0
Elmo	4.75	32	22	54	5 0
Cuba City	4.75	35	22	57	5.0
Benton	4.75	38	22	60	5.0
Buncombe	4.75	42	22	64	5.5
Hazel Green	4.75	45.3	22	67.3	5.5

The petitioner further alleges that, effective April 15, 1911, the respondents Chicago & North Western and Mineral Point

& Northern railway companies propose to cancel the present arrangement by which the distance tariff rate for the combined distance is in effect, and thus to make the only available rates the sum of the local distance rate, class E, from the point of origin to Whitson Jct., and the local distance rate, class E, from Whitson Jct. to Mineral Point. The effect of the proposed change, as described by the petitioner, is shown by the following tabulation.

From C. & N. W. stations.	Present rates, cts.	Proposed Rates, cts. per 100 lbs.				
		Origin to Whitson Jct.		Whitson Jct. to Min. Pt.		Total rate to Mineral Pt.
		Miles.	Rate.	Miles.	Rate.	
Dodgeville	4.5	10.0	3.0	22	4	7.0
Edmund	4.0	1.9	2.0	22	4	6.0
Cobb	4.0	1.5	2.0	22	4	6.0
Montfort	4.0	6.0	3.0	22	4	7.0
Livingston	4.5	11.0	3.4	22	4	7.4
Rewey	4.5	16.0	3.8	22	4	7.8
Ipswich	5.0	27.0	4.0	22	4	8.0
Elmo	5.0	32.0	4.5	22	4	8.5
Cuba City	5.0	35.0	4.5	22	4	8.5
Benton	5.0	38.0	4.5	22	4	8.5
Buncombe	5.5	42.0	4.5	22	4	8.5
Hazel Green	5.5	45.3	5.0	22	4	9.0

In conclusion, the petitioner alleges that both the present rates and the proposed rates are excessive, unjust, unreasonable and unlawful; that shipments of zinc ore are made in large quantities to Mineral Point, load to an average of approximately 70,000 lbs. per car, are of great weight in proportion to the bulk and of low value in proportion to the weight and bulk, require no special expedition in transit, and are not perishable or subject to any considerable loss or damage in transit; and that a just and reasonable joint commodity rate on zinc ore originating on the line of the respondent Chicago & North Western Railway Company and moving to Mineral Point over the lines of that company and of the other respondents herein from the stations above mentioned, would not exceed but would be less than the sum of 4 cts. per 100 lbs.

Wherefore, the petitioner prays that the Commission prescribe just and reasonable joint commodity rates for the shipments above described, and require the respondents to suspend, pending the hearing and investigation of this complaint, the effectiveness of the proposed change which the Chicago & North Western and Mineral Point & Northern railway companies had announced as taking effect April 5, 1911.

In view of the petitioner's allegation that the proposed change in rates would involve an advance of 50 to 70 per cent over the present rates, an order was issued by this Commission, dated March 30, 1911, staying the effectiveness of the proposed rates pending the investigation and determination of the matters involved in the complaint herein.

Separate answers to the complaint were filed by the respondents, the Chicago & North Western and the Chicago, Milwaukee & St. Paul railway companies. Both companies denied that the rates now in effect were unreasonable, unjust, or unlawful, and in addition the Chicago, Milwaukee & St. Paul Railway Company averred that there was no reasonable necessity for the establishment of joint rates with the Chicago & North Western Railway Company to Mineral Point.

A hearing was held in the matter at the office of the Commission, May 10, 1911. The petitioner was represented by *Drew & Jameson;* the respondent Chicago & North Western Railway Company by *F. D. Fulton* and *H. C. Cheyney;* the respondent Chicago, Milwaukee & St. Paul Railway Company by *F. G. Wright;* and the respondent Mineral Point & Northern Railway Company by *C. W. McIlhon.* Subsequent to the hearing, a written brief was submitted by the attorneys for the petitioner.

The commercial situation, as brought out by the testimony in this case is, briefly, as follows: The petitioner, mining and buying zinc ore at various points on the Chicago & North Western line, ships the ore to its separator plant at Mineral Point, where the iron pyrites are removed and the zinc in its purer state, then known as concentrates, is re-shipped over the Chicago, Milwaukee & St. Paul line to the petitioner's spelter plant at Depue, Ill. The separating process is necessary in order to reduce the ore to the quality required by the spelter plant, and to save paying freight upon the valueless iron. From a ton of the raw ore about half a ton of concentrates is obtained. In all these processes the petitioner competes with other companies whose separator plants are located at Platteville and Cuba City, Wis., and Galena, Ill., on the Chicago & North Western line, and whose concentrates are shipped to spelter plants on the Chicago & North Western line at La Salle and

Peru, Ill., and Grasselli, Ind. These competing plants, whose entire transportation needs are thus confined to the North Western line, enjoy a concentration rate of 40 cts. per ton on ore shipped to Platteville, Cuba City and Galena for separation, while their rate out of these points to the Illinois and Indiana points named is $1.40 per ton. The Chicago, Milwaukee & St. Paul rate on the petitioner's shipments from Mineral Point to a point two miles from Depue, Ill., is 80 cts. per ton.

It will be seen, therefore, that while the petitioner's rate into Mineral Point is much higher than that of its competitors, averaging about $1.05 per ton, its rate on concentrates out is much lower. Since two tons of ore make about one ton of concentrates, the relation between the petitioner and its competitors on the entire transportation of a ton of finished product under the present rates is as follows, as shown in the petitioner's brief:

	Petitioner.	Competitor.
2 tons ore to separator plant	$2.10	$0.80
1 ton concentrates to spelter plant	.80	1.40
Total cost	$2.90	$2.20

The principal sources of the ore shipments to the petitioner's separating plant at Mineral Point are the mines at Highland, on the Mineral Point & Northern Railway, and at Hazel Green, Benton, Strawbridge, and Livingston, on the Chicago & North Western line. Out of a total of 31,892 tons of ore shipped to Mineral Point from points on the Chicago & North Western line in 1910, 17,141 tons were shipped from mines owned by the petitioner, and the remainder was bought from other mines; and of the total shipments by far the largest part came from points south of Platteville. Notwithstanding the fact that the haul via Platteville is thus the shortest haul for most of the ore received by the petitioner, the movement since 1905 has been almost entirely via Whitson Jct. and the Mineral Point & Northern line. The reasons for this, as given by the petitioner, are that the Mineral Point & Northern line is almost entirely owned by the petitioner, and also that in view of the low rate which the Chicago, Milwaukee & St. Paul line offered from Platteville to Mineral Point, that line was not willing to do the switching service at the petitioner's plant which could be done by the Mineral Point & Northern Company's engines. Moreover, since 1909, as is shown by the tabulations accompanying the statement of the complaint above, the rate via Platteville and the Chicago, Milwaukee & St. Paul line has been higher than the rate via Whitson Jct. and the Mineral Point & Northern line, even where the latter route is much the longer haul.

If, instead of routing all shipments via Whitson Jct., those for which the Platteville routing was the shorter were routed by way of Platteville, the shortest haul from each originating point to Mineral Point would be as follows:

From	Distance mi.	Via.
Hazel Green	48.5	Platteville
Buncombe	45.2	"
Strawbridge	43.4	"
Benton	41.2	"
Cuba City	37.7	"
Elmo	35	"
Leslie	35.5	"
Rewey	37.9	Whitson Jct.
Livingston	33.1	" "
Montfort	29.2	" "
Dodgeville	31.6	" "

In support of its contention that the Wisconsin distance tariff class E rates were too high for the shipments of ore involved herein, under the present system of applying the rate for the combined distance as well as under the proposed system of applying the two local rates for the distances to and from the junction point, the petitioner offered a number of exhibits showing rates on zinc ore in various parts of the country. In addition to comparing the petitioner's rates with existing commodity rates on the Chicago & North Western and the Chicago, Milwaukee & St. Paul lines for single line shipments in the territory herein involved, these tables include rates in Kansas, Missouri, Pennsylvania and New Jersey, most of which are single line rates, but some of which are joint through rates. None of the rates named in these comparisons, except those on the Chicago & North Western line in Wisconsin, are subject to the condition that re-shipment take place over the same line. At two of the points named in the comparisons, Iola and Gas, Kan., the corporation of which the petitioner is a subsidiary part, operates plants similar to that at Mineral Point, and the manager of the petitioner testified that traffic conditions were very similar at those points to the conditions in Wisconsin.

Most of the comparisons thus submitted by the petitioner involve hauls much longer than any that are involved in this proceeding. As will be seen from the tabulation last given above, the longest haul necessary in the petitioner's operations is less than fifty miles. When the long haul rates included in the petitioner's comparisons are compared with the Wisconsin distance tariff rate for hauls of similar length, they show the rates in the other states to be upon the average perhaps about half as high as the Wisconsin distance tariff rates; but the fact that there is no zinc ore movement in Wisconsin for such distances makes it impossible to draw any direct conclusions from these figures as to the manner in which the actual Wisconsin rates compare with those in the other states. It would be hardly fair to assume that if the Wisconsin zinc ore movement covered a distance of 100 to 300 miles, as is the case in the other states named, the Wisconsin distance tariff would be used for such distances; and to base upon this assumption a conclusion that the actual Wisconsin rates are proportionately as much in excess of the rates for other states as is the distance tariff on long hauls.

Certain of the rates, however, which are included in the petitioner's comparisons, are for distances comparable to those involved in the Wisconsin zinc ore movement, and the results of these comparisons are shown in table I.

Of the rates shown in table I, those which are joint commodity rates are the most directly suitable for comparison with the rates involved in this case, but none of the joint commodity rates given happen to represent distances as short as those over which the petitioner's ore moves. All of the single line hauls mentioned, though for distances similar to those involved in this case, are necessarily made under conditions differing somewhat from the petitioner's conditions in the fact that they are not for joint hauls; while the Chicago & North Western concentration rates quoted, which are the rates enjoyed by the petitioner's competitors, are of course not immediately comparable with rates which do not involve an out haul on the same line.

The Missouri Pacific proportional rates quoted in table I are not claimed to be directly comparable with full joint rates for like distances, but are introduced by the petitioner on the theory that the haul on the Chicago & North Western line in the present case is really only a proportional haul and that that line should be content with a revenue similar to that shown in the table for the Missouri Pacific line.

TABLE I.

COMPARISONS OF RATES ON ZINC ORE ON VARIOUS RAILWAY LINES.
RATES IN CENTS PER TON OF 2,000 LBS.

Road.	Points.	Distance.	Rates, cts.	Wis. dist. tar. class E rates, cts.
1. *Single Line Commodity Rates.*				
C. M. & St.	Platteville to Mineral Pt. Wis.	26.3	40	80
Mo. Pac.	Aurora, Mo. to Carthage, Mo.	39	93.33	90
" "	Aurora Mo. to Joplin. Mo.	56	93.33	100
" "	Aurora, Mo. to Pittsburg, Kan.	69	93.33	110
" "	Carthage, Mo. to Joplin, Mo.	17	60	76
St. L. & S. F.	Aurora, Mo. to Joplin, Mo.	64	20	110
" " " " "	Carl Jct., Mo. to Joplin, Mo.	10	20	60
" " " " "	Carterville, Mo. to Joplin, Mo.	7	20	60
" " " " "	Webb City, Mo. to Joplin, Mo.	5	20	40
" " " " "	Galena, Kan. to Joplin, Mo.	9	20	60
Kan. City So.	Joplin, Mo. to Pittsburg, Kan.	26	73.2	80
" " "	Tipton Ford, Mo. to Joplin, Mo.	10	53.2	60
2. *Single Line Concentration Rates.*				
C. & N. W.	To Platteville, distances.	30	40	80
		40	50	90
		50	60	100
		60	70	100
3. *Joint Commodity Rates.*				
Lehigh & H.; Cent. of N. J.	Franklin Jct., N. J. to Bethlehem, Pa.	68	62.5	110
Same lines	Franklin Jct., N. J. to Hazard, Pa.	88	62.5	120
Kan. City So.; M. K. & T.	Tipton Ford, Mo. to Chanute, Kan.	87	113	120
4. *Proportional Rates.*				
On Mo. Pacific Line, from Neodesha, Kan.; shipments originating on St. L. & S. F. and M. K. & T. Rys.	To Altoona, Kan.	7	20	60
	To Gas, Kan.	60	30	100
	To Iola, Kan.	56	30	100
	To La Harpe, Kan.	62	30	110
	To Caney, Kan.	41	20	90
	To Deering, Kan.	28	20	80

Subject to the differences above described, the rates given in table I may give some idea of the relation between the present Wisconsin rates and those in other states on the same commodity for similar distances. Just how much the difference between single line and joint rates in some of the cases, between concentration and regular rates in others, and between proportional and full through rates in the third class of cases, will affect the validity of the comparison, cannot be stated with accuracy, and as a result the table is merely presented for what it is worth. A close study of it, however, with sufficiently liberal allowances for these differences in basis, leaves the impression that the present Wisconsin rates are, on the whole, materially higher than the other rates would be if they could be reduced to an equal basis of comparison.

Further evidence on the part of the petitioners related to the character of the traffic in zinc ore. The testimony on this subject, which was not controverted by the respondents, substantiates the allegations of the complaint, that the zinc shipments load heavily, do not require special equipment, are little subject to damage in transit, and are unloaded by the petitioner itself. The average loading per car of the shipments received by the petitioner in 1910 was about 70,000 lbs., while in 1911, up to the time of the hearing, the average was somewhat higher. Another point relied upon by the petitioner was the regularity of the movement. With the exception of the month of January, 1910, when one of the petitioner's mills was shut down and the snow was very heavy on the respondent's lines, the average movement for the fifteen months preceding May 1 last was 2,782 tons per month. The maximum was 4,024 tons and the minimum 1,020 tons, and the great majority of the months were within 800 tons of the average.

A further contention of the petitioner was that it was entitled to favorable consideration on the part of the railroads on account of the large amount of traffic other than zinc shipments which it created. This traffic moving over the North Western line, during the year 1910, was testified to consist of 307 cars of coal, 28 cars of brick and cement, 18 cars of iron and steel, 6 cars of lumber, and 253 cars of soft coal for the petitioner's mines. The use of coal by the petitioner was stated to be greater than that of its competitor at Platteville, by reason of a different method of separating the ore; but, on the other hand, the Platteville competitor preserves and ships certain by-products of the separating process which the petitioner does not handle.

On the part of the respondent Chicago & North Western Railway Company it was argued that the petitioner was not placed at an unreasonable disadvantage as against its competitors at Platteville, Cuba City and Galena, for the reason that the competitors were able to give the Chicago & North Western line the haul out of the concentrating point, which the petitioner was not doing. Attention was called to a Chicago & North Western tariff which gave the petitioner a rate of 40 cts. per ton to Whitson Jct. from all the stations from Dodgeville to Ipswich, inclusive, 50 cts. from Elmo and Cuba City, 46⅔ cts. from Benton, and 60 cts. from Buncombe and Hazel Green, all conditioned on the movement of the product out via the North Western line. Thus, it was urged, the Chicago & North Western line gave the petitioner the advantage of the same concentration rate that was given its competitors for like distances, if the petitioner would conform to the condition regarding shipments out.

As to the proposed new schedule of rates, it was claimed by the respondent Chicago & North Western Railway Company that on those shipments for which the haul via Whitson Jct. and the Mineral Point & Northern line was the shortest haul, there would be very little change in the total rate, if the Mineral Point & Northern line received as its proportion the same amount now received under the combined distance provision. This contention may be illustrated by a combination of two exhibits introduced by the respondent:

From C. & N. W. stations.	Present rate divisions.			Proposed rates.		
	Total rate, cts.	C. & N. W. proportion, cts.	M. P. & N. proportion, cts.	C. & N. W. class E, cts.	M. P. & N., same as present revenue, cts.	Total proposed rate, cts.
Dodgeville	4.5	3	1.5	3	1.5	4.5
Edmund	4	2.7	1.3	2	1.3	3.3
Cobb	4	2.7	1.3	2	1.3	3.3
Montfort	4	2.7	1.3	3	1.3	4.3
Livingston	4.5	3	1.5	3.4	1.5	4.9

The proposed rates as given in the foregoing table differ from those given in the petition and heretofore presented, in that the respondent assumes that the Mineral Point & Northern Railway, instead of charging the regular class E distance rates for its part of the haul, will be content with the same revenue that it now receives as its proportion of the through rate. In other words, the Chicago & North Western line proposes to adopt for itself the local distance rate and leave the Mineral Point & Northern on the present basis of a proportional rate. While, apparently, the local distance rate on the Chicago & North Western line, for the points named above, differs little, and in some cases is even lower than the Chicago & North Western proportion of the present rate, it is to be noted that none of the ore movement from Chicago & North Western points to the petitioner at Mineral Point originates at any of the points named in the above table except at Livingston, at which point the respondent's table shows an increase of 0.4 cts. over the present rate. A diagram and map of the zinc region, submitted by the Chicago & North Western Railway Company and showing the location of the various mines, fails to show that there are any mines on its line east of Montfort, and indicates that the greatest producing regions are in the neighborhood of Platteville, Benton, and Hazel Green, and at points on the Mineral Point & Northern line. Thus, all of the Chicago & North Western points from which ore actually moves to the petitioner are either so situated that the shortest distance is via Platteville and the Chicago, Milwaukee & St. Paul line, or are so situated as to be subjected to an increase in rate under the proposed schedule, even according to the Chicago & North Western's calculation of what the proposed rates will be. And as to points for which the distance via Platteville and the Chicago, Milwaukee & St. Paul line is the shorter, the present rates by this shorter route are higher than the present rates over the longer route; but the proposed rates for the longer route would reverse this relation. The net result of these facts is that the effect of the proposed change would be that, for the bulk of the petitioner's shipments, rates which are now so high that the petitioner does not use them, would be the lowest rates available.

The respondent Chicago & North Western Railway Company also suggested during the course of the hearing that the extremely low rate given to the petitioner by the Chicago, Milwaukee & St. Paul line on shipments out to the petitioner's Illinois plant, coupled with the fact that the petitioner was the virtual owner of the Mineral Point & Northern Railway, made the latter railway, as a matter of fact, a "tapped line proposition," and that it would be not only commercially unwise but actually illegal for the Chicago & North Western line, by the establishment of a joint rate, to become a party to such a scheme. This charge was vigorously denied by counsel for the petitioner, who pointed out that the Mineral Point & Northern line was a common carrier, built to reach points to which the Chicago & North Western line had refused to extend, depended for its support not only upon the petitioner's business but upon other industries along its line, and had never been a source of profit to its stockholders.

It appears from the foregoing table that zinc ore is worth about 91 cts. per 100 lbs. This figure exceeds the value of iron ore and even of pig iron, and also of both hard and soft coal. It is of nearly the same value per 100 lbs. as corn and oats, but differs from these commodities in that it is little susceptible to damage in transit.

It is thus apparent that zinc ore, when compared with the majority of commercial articles, is a fairly low grade commodity, though there are a few commodities of less value. It was stated at the hearing that in case of wreck ninety-five per cent of a shipment of zinc ore could be picked up undamaged along the right of way, and that shipments could be made in open cars throughout the year, so far as any effect upon the quality of the ore was concerned. The comparatively low value of this ore, coupled with the regularity of movement, freedom from damage in transit, and adaptability to almost any kind of railway equipment, marks it as entitled to fairly low rates, perhaps a little lower than most commodities of equal value.

An element of much importance in judging of the reasonableness of a given system of rates is the value of the commodity carried. It is axiomatic that a commodity of low value in proportion to its weight should not pay as high a freight rate, other things being equal, as a commodity of high value. The average price of zinc ore at the petitioner's mines in 1910 was stated at the hearing to be $18.26 per ton. The relative position of this commodity among a number of the principle articles of trade is shown in table II, which is here reprinted, with a few slight changes, from a recent decision of this Commission:

TABLE II.

PRICES OF COMMODITIES.

Date Nov. 1, 1910; taken from various publications.

Commodity.	Unit.	Price.	Basis of reduction to pounds.	Price per 100 lbs.
Coke, Connellsville	to	$1.55	Ton 2000 lbs.	$0.08
Coal, bituminous	to	3.225	Ton 2240 lbs.	.13
Brick, common	M	5.50	4 lbs. per brick	.14
Iron ore, Bessemer	to	5.00	Ton 2240 lbs.	.22
Coal, anthracite	to	5.00	Ton 2240 lbs.	.22
Salt	sack	.80	224 lb. sacks	.36
Potatoes	180 lbs.	1.25		.70
Iron, pig, No. 1	ton	15.75	Ton 2240 lbs.	.70
Cement, Portland	bbl	1.50	200 lbs. per bu	.75
Corn, No. 2	bu.	.57	70 lbs. per bu	.82
Zinc ore	ton	18.26	Ton 2000 lbs.	.91
Oats, No. 2	bu.	.34	32 lbs. per bu	1.06
Hay	100 lbs.	1.10		1.10
Petroleum, refined	gal.	.074	6.4 lbs. per gal	1.16
Lumber, pine	M	30.00	2500 lbs. per M	1.20
Steel rails	ton	28.00	Ton 2240 lbs.	1.25
Wheat, No. 2	bu.	.96	60 lbs. per bu	1.60
Apples	bbl.	3.00	150 lbs. per bbl	2.00
Flour	bbl.	4.25	200 lbs. per bbl	2.13
Milk	qt.	.048	2.15 lbs. per qt	2.22
Paper, news, roll	lb.	.026		2.60
Lumber, cedar	100 ft.	8.00	3000 lbs. per M	2.67
Tin plates	100 lbs.	3.50		3.50
Lead, pig	lb.	.044		4.40
Sugar, granulated	lb.	.046		4.60
Hemp, Manila	lb.	.05		5.00
Cattle	100 lbs.	5.50		5.50
Hogs	100 lbs.	6.20		6.20
Beef, carcasses	lb.	.095		9.50
Coffee, Rio	lb.	.11		11.00
Lard	lb.	.1215		12.15
Tobacco, Burley	lb.	.13		13.00
Hides, steer, No. 1	lb.	.145		14.50
Cotton	lb.	.1455		14 55
Wool, Ohio, washed	lb.	.29		29.00

The value of zinc ore, while greater than fuel wood, logs and bolts, coal, brick, cement and other commodities of this kind, is low enough to entitle it to a comparatively low rate from the point of view of that element in the rates of transportation which is usually termed the value of the service. This finding also applies from the standpoint of certain other elements in rate making which are usually embraced in competitive or commercial conditions generally, as is obvious from the rate comparisons which have been made in this case and which, to some extent, have been presented and analyzed in the preceding pages.

The cost per unit of this traffic is also relatively low. This is due to the fact that the loading per car is unusually heavy, causing the proportion of "dead" to "pay" weight in each load to become relatively small, and also to the regularity of the movement and other factors. In cases of joint rates the cost of transportation is, of course, increased by additional terminal expenses, due to the fact that the traffic must be transferred from one line to another. But in the instant case, on account of the heavy loading, the amount per unit even of this extra cost is relatively low. Another element that enters into the cost is the empty car mileage. It is quite likely that in this case this mileage is relatively greater than for many other kinds of traffic; but even when costs per unit are increased by a substantial amount from this source, they remain on a comparatively low level.

The economies in the handling of the freight at the terminals and in moving it between the terminals that is brought about by heavy loading per car, is such that in this case the costs per unit are low, even when full weight is given both to the extra terminal cost involved in joint traffic and to the value of the ore, or the commodity in question. A terminal charge of 60 cts. per ton, one-third of which is covered by the extra terminal charge, and a movement charge of 6 mills per ton per mile, will not only cover the proportion this traffic should bear of the operating expenses of the road, but of the returns the carriers are entitled to receive on their investment. The shortest distances involved in this case seem to vary from somewhat less than 30 miles to about 48 miles. On the above unit costs, the rates in cents per cwt. would be 3.90 for 30 miles; 4.20 for 40 miles; and 4.45 for 48 miles. As in the past this traffic has mostly been kept on the same rate basis, it is not unlikely that conditions have thereby been established that would tend to require the continuance of this practice. In view of the rather limited variations in the distances such a rate basis would also seem to be entirely practicable. We are of the opinion that the joint rate in this case should not exceed 4.50 cts. per cwt.

On raw material originating on their own lines and which can also be manufactured into finished products at points on their own lines, the carriers are unwilling to establish joint rates with other carriers in cases where such joint rates may tend to reduce their traffic. With this position it is difficult to quarrel, at least when it is not carried to a point where the public interests involved are greater than those of the carrier. The ore involved in his case is produced on the lines of the Chicago & North Western Railway. It is taken to a point on the Mineral Point & Northern and the Chicago, Milwaukee & St. Paul railways, and there manufactured into products which are largely shipped out over the lines of the Chicago, Milwaukee & St. Paul Railway Company. It is obvious from these facts that there are private reasons why the former road should desire to prevent this traffic from going off its lines.

These reasons, however, important as they may be, are secondary to those of a public nature. The plant to which the ore is carried, and on which it depends for the ore for its operation, represents a large fixed investment and an established business. The ruination of this, or even a serious injury to it, would undoubtedly be of greater public moment than at most a small loss of traffic to one of the carriers. Changes of this character usually result in waste of capital as well as in other factors of production, and also tend to upset things generally and should, therefore, be avoided whenever possible. Under conditions like these, public interests demand that the rates should be so adjusted as to result in the greatest good to the greatest number. For handling such traffic, carriers are entitled to rates that will yield them returns that are fully adequate as compensation for their services. But when assured of such rates, it is their duty, under the circumstances, to grant joint rates and traffic arrangements.

IT IS THEREFORE ORDERED, That the respondents, the Chicago & North Western Railway Company and the Chicago, Milwaukee & St. Paul Railway Company, discontinue their present rates and in place thereof establish joint rates on zinc ore from the mining points on the Chicago & North Western Railway involved herein to Mineral Point that for like distances do not exceed 4.50 cts. per cwt. The rates thus named herein shall be subject to the present rules of the carriers as regards the minimum weight per carload of zinc ore.

IT IS THEREFORE ORDERED, That the respondents, the Chicago & North Western Railway Company and the Mineral Point & Northern Railway Company, discontinue their present rates and in place thereof establish joint rates on zinc ore from the mining points on the Chicago & North Western Railway involved herein to Mineral Point that for like distances do not exceed 4.50 cents per cwt. The rates thus named herein shall be subject to the present rules of the carriers as regards the minimum weight per carload of zinc ore.

JOHN RINGLE ET AL.
VS.
CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY,
CHICAGO AND NORTH WESTERN RAILWAY COMPANY,
CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY,
MINNEAPOLIS, ST. PAUL AND SAULT STE. MARIE RAILWAY COMPANY,
GREEN BAY AND WESTERN RAILROAD COMPANY,
NORTHERN PACIFIC RAILWAY COMPANY,
CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY,
ILLINOIS CENTRAL RAILROAD COMPANY.

Submitted Aug. 3, 1911. Decided Aug. 15, 1911.

Petition for a re-hearing on the grounds that the rates fixed in the former order (7 W. R. C. R. 170) are unreasonably low; that it contains conflicting provisions in that the maximum rates are fixed and yet the order, in effect, prohibits the increasing of rates in places where they are lower than those fixed by the order as reasonable; that the order exceeds the power and jurisdiction of the Commission in that it makes a reduction on certain rates below the request for reduction made in the complaint.

Held: That the Commission had authority to fix reasonable rates for the reason that the petition asked that the Commission fix rates that "should not exceed" certain rates named, and also under the provisions of sec. 1797—12; that there is no contradiction in fixing rates which are considered reasonable as distance rates, and leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable, the respondents having the right, in case they consider the commodity rates too low, to petition for an increase; that the most important element in fixing rates is the cost of service, subject to modification by reason of commercial conditions; comparisons with rates elsewhere serve as an indication of the conditions which surround the industry as a whole; that owing to higher value, danger of breakage and inability to load heavily, drain tile and sewer pipe should be eliminated from the order; that sand and lime brick, being about the same in quality and character as other brick, should be included in the order; that ordinarily the difference between rates on main lines and on branch lines based on cost of traffic should be eliminated and such rates based on conditions for the line as a whole; that the request that the lowest rate be fixed at 2 cts. instead of 1.7 cts. is reasonable. The former order is modified as indicated.

Shortly after the filing of the decision and order of the Commission in the above entitled case (7 W. R. C. R. 170), the respondent Chicago & North Western Railway Company petitioned for a re-hearing, on the grounds that the rates fixed in said order are unreasonably low, and particularly in relation to the short distance rates and rates for 80 to 100 miles; that the order contains conflicting provisions, in that the maximum rates are fixed thereby, and yet the order, in effect, prohibits the increasing of the rates in places where they are lower than these fixed by the Commission as reasonable; and that the order exceeds the power and jurisdiction of the Commission, in that it makes a reduction on certain of the rates below the request made for reduction of rates in the complaint, and, inasmuch as the hearing was upon a specific complaint, the Commission is without authority or jurisdiction to make reductions below the rates asked for in the complaint.

In compliance with the request as above stated, a re-hearing was ordered, and was held at the office of the Commission Aug. 3, 1911. The appearances were as follows: For the original petitioners, *John Ringle;* for the Chicago, Milwaukee & St. Paul Railway Company, *J. H. Prendergast;* for the Chicago & North Western Railway Company, *F. P. Eyman* and *H. C. Cheyney;* for Chicago, St. Paul, Minneapolis & Omaha Railway Company, *E. B. Ober;* for the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, *A. H. Bright;* and for the Illinois Central Railroad Company, *J. H. Cherry.*

The various points raised in the petition for re-hearing and at the re-hearing itself as reasons why the order of the Commission should be modified, may be grouped into a number of heads, as follows:

1. The jurisdiction of the Commission was challenged as to such of the rates fixed by it as were lower than those asked for by the petitioners. This objection may be disposed of briefly by calling attention to the fact that the petitioners suggested in their petition that the rates to be fixed by the Commission "should not exceed" certain rates named; also that the statute (section 1797—12) empowers the Commission, upon finding, after complaint and investigation, that the rates complained of are unreasonable, "to fix and order substituted therefor such rate or rates * * * as it shall have determined to be just and reasonable." The Commission is thus not bound by the

suggestions of the petitioners, but is free to establish what it considers to be reasonable rates under the circumstances of the case.

2. The order of the Commission was claimed to be inconsistent in purporting to fix reasonable rates and yet in stipulating that no present rates lower than those fixed in the order should be affected by the order. This provision was inserted in the order to prevent the rates therein fixed from displacing lower commodity rates now in effect at various points. There is no contradiction in fixing rates which are considered to be reasonable as distance rates, and yet leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable. The reasonableness of these commodity rates is not directly at issue in the present proceeding, and at any time they are considered by the carriers to be too low, the carriers may petition the Commission for authority to change them.

3. It was objected that the Commission, in fixing the distance rates named in its order, used as a basis comparisons with commodity rates in Wisconsin and other states, and that such rates, being fixed in each case to meet special conditions, were not a proper basis for making distance rates. As a matter of fact, however, the rates fixed by the Commission are not based primarily, or even to any considerable extent, upon the rates with which comparison is made. As has often been said by this Commission, the most important element in the fixing of rates is the cost of service, subject to modification by reason of commercial conditions, such as the value of the article carried, the competitive situation of both the producer and the carrier, etc. Comparisons with rates elsewhere in effect are of value, not as determining what the rates in a given case should be, but as an indication of the conditions which surround the industry as a whole. It need hardly be pointed out that the financial and commercial situation of almost every industry is largely affected by the cost of transporting its products. Thus, while the cost of service is the element of most vital importance, a comparison of existing rates with the rates under which similar traffic actually moves in other regions is also of some value. Where specific commodity rates are in effect, lower than distance tariff rates for the same territory, the latter rates are not the ones under which the actual movement takes place, and it is desirable, therefore, to include specific commodity rates in the comparison. The

effect of special and local conditions at various points enters more or less strongly in the fixing of these commodity rates, and as a result the rates with which comparison is made must be considered not singly, but as a whole, in determining their general effect upon commercial conditions; but the comparisons presented by the Commission in its decision include so many rates, representing not single instances but averages, that, it is believed, a sufficiently broad view of the rate situation as a whole in the territory included in the comparisons is gained.

4. Attention was called to the fact that the order of the Commission includes drain tile and sewer pipe, and does not differentiate between common brick and the higher grades of brick. It seems that drain tile cannot be loaded as heavily as brick, on account of danger of breakage, and that the same is true of sewer pipe. The order of the Commission, by fixing the minimum at 50,000 lbs. for tile as well as for brick, has raised the rate on tile, since the average loading, as reported by the Chicago & North Western Company, is only about 38,000 to 42,000 lbs. Instead of this prohibitive minimum of 50,000 lbs., it was suggested that the minimum be left at 30,000 lbs. and the rate be fixed somewhat higher than the regular brick rate. As to the different grades of brick, it appears that common brick is worth about $6 per thousand, while other grades range in value as high as $30 or $40 per thousand. It was further suggested at the re-hearing and in a letter from a manufacturer that sand and lime brick be included in the order, since it is very similar to clay brick in quality and price. No objection to this addition was made by the representatives of the carriers at the hearing.

5. As to the element of cost of service, the only suggestion made by the majority of the carriers was that this cost was largely increased by the amount of empty car mileage involved in the brick movement in this state. It was stated that, contrary to the case in Illinois, it is necessary for the railroads to send empty cars to the brick manufacturing points for loading, since the inbound shipments of other commodities at these points are not sufficient to provide empties for the brick movement out.

6. It was claimed by the representative of the Illinois Central Railroad Company that in determining the cost of service upon which the rates were to be based, the Commission should not assume that the unit costs for one or two of the larger lines in the state represent the costs for all, but should consider the

cost of service on the Illinois Central line separately in making rates to apply on that line. Moreover, it was urged that it was unfair to take the cost of service on the entire line of the Illinois Central Railroad Company as a basis for rates in Wisconsin, but that only the Wisconsin portion of the road should be considered.

7. It was argued on the part of the Chicago, St. Paul, Minneapolis & Omaha Railway Company that the conditions applying to the brick movement on that line were so different from those on the other lines herein involved that the rates fixed for those lines should not apply to the Omaha road. This difference in conditions was said to consist in the fact that competition is not such on this line as to demand any decrease in rates; that the brick used at points on this line is all manufactured at yards on the same line, so that the element of interstate competition is not present as it is in southern and central Wisconsin; and that the Omaha line now has very low commodity rates applying from its brick producing points, and these rates are so low that 70 per cent of the shipments from brick producing points on this line go beyond the state of Wisconsin.

8. A further objection voiced by the representative of the Chicago, St. Paul, Minneapolis & Omaha Railway Company was as to the need of joint rates. The fixing of joint rates, it was claimed, was contrary to the interests of the brick manufacturers themselves, for, while such rates would enable a given manufacturer to compete with manufacturers on other lines than his own, the other manufacturers would have the same facility in competing with him in his own market, and the only net result would be a reduction of revenue to the railroads.

9. The representative of the Chicago & North Western Railway Company requested the Commission to modify its order so that the lowest rate would be 2 cts. instead of 1.7 cts., for the reason that the Chicago & North Western Railway Company has no distance tariff, in any of the states in which it operates, in which the minimum rate is less than 2 cts. for a five mile haul. The representative of the petitioners stated that a rate of 2 cts. for the 10 mile haul, instead of 1.85 as stated in the Commission's order, would be satisfactory to them, thus making the minimum rate on brick shipments 2 cts. per 100 lbs. He added that the amount of traffic which moved less than ten miles was very slight.

10. The gradation of the rates as fixed in the order of the Commission was subjected to criticism by one of the respondents, on the ground that it was not sufficiently uniform. It was pointed out that the Commission's rates increased 0.15 cts. for each 5 miles up to 45 miles, 0.1 ct. for 50 and 55 miles, 0.15 for 60 and 65 and 70 miles, and 0.1 ct. for 75 to 100 miles; above 100 miles, the increase is 0.1 ct. for each 10 miles up to 200 miles, and 0.2 ct. for each 10 miles from 200 to 300 miles. It was suggested that a more consistent gradation would be as follows: Beginning with the 5 mile rate at 2 cts., an increase of 0.15 cts for each 5 miles up to 100 miles; 0.2 ct. for each 10 miles from 100 to 200 miles; 0.1 ct. for each 10 miles from 200 to 300 miles.

In addition to the specific objections enumerated above, the case of the respondents upon the re-hearing included exhibits showing the distance tariff rates on brick in other states, as compared with the present Wisconsin rates and the rates ordered and recommended by the Commission. A combination of two exhibits thus presented is shown in table I (see next page).

From a reading of the table it is clear that the rates established by this Commission for this state are considerably lower than the distance tariff rates in the other states. Just how much significance should be attached to these differences, however, is not clear. The rates made by this Commission were computed on a basis upon which it was demonstrated that they will cover operating expenses, including as much in the way of return upon the investment as it was determined should be borne by traffic of this character. Furthermore, they were intended to meet the conditions closely enough so that the traffic would move under them. Whether these facts apply to the other rates in the table has not been shown. It is the practice of the carriers, both in this and other states, to make distance tariffs that are comparatively high and which apply between places where the traffic is light, and then to make lower commodity tariffs which apply where the traffic is heavier. Now, if the rates for the other states in the table are taken from that class of distance tariffs just described, it is only natural that they should be higher than the rates fixed by this Commission. It is also quite likely that the distance rates thus given for the other states are higher than the commodity rates in these states. If this is the case, then it is no more to the point in this case to compare these distance rates for other states with the rates in the table fixed by the Commission than it would be to compare them with the commodity rates in the same states. For, as already intimated, the rates in question made by the Commission were intended as a sort of distance commodity rates upon which the brick traffic in this state would move.

TABLE I.

DISTANCE TARIFF RATES ON BRICK

AS PRESENTED BY RESPONDENTS.

Miles.	Commission rates, cts.	PRESENT DISTANCE RATES, IN CTS. PER 100 LBS.					
		Wis.	Minn.	Iowa.	Neb.	S. Dak.	Ill.
5	1.7	2	2	2.8	2.5	2	2
10	1.85	3	3	3	3	2.7	3
15	2	3.4	4	3.1	3	3.1	3.5
20	2.15	3.5	4	3.2	3.5	3.6	3.8
25	2.30	4	4	3.3	3.5	4	4
30	2.45	4	4.5	3.4	3.5	4.5	4.2
35	2.6	4.5	4.5	3.5	4	4.5	4.4
40	2.75	4.5	4.5	3.6	4	4.5	4.5
45	2.9	4.5	5	3.7	4.5	5	4.7
50	3.05	5	5	3.8	4.5	5	4.9
55	3.15	5	5.5	3.9	5	5.5	5
60	3.3	5	5.5	4	5	5.5	5.2
65	3.45	5	6	4.1	5	6	5.4
70	3.6	5	6	4.2	5	6	5.5
75	3.7	5.5	6.5	4.3	5	6.3	5.6
80	3.8	5.5	6.5	4.4	5.5	6.5	5.8
85	3.9	6	7	4.5	5.5	6.7	5.9
90	4	6	7	4.6	6.5	7	6
95	4.1	6	7.5	4.7	6.5	7.2	6.2
100	4.2	6	7.5	4.8	7	7.2	6.3
110	4.3	6.5	8	5	7	7.6	6.6
120	4.4	6.5	8	5.2	7	8	6.8
130	4.5	7	8.5	5.4	7	8.5	7.1
140	4.6	7	8.5	5.6	7	8.5	7.4
150	4.7	7.5	9	5.8	7.5	9	7.6
160	4.8	7.5	9	6	8	9	7.8
170	4.9	8	9.5	6	8.5	9.5	8
180	5	8	9.5	6	9	9.5	8.2
190	5.1	8.5	10	6.5	9.5	10	8.4
200	5.2	8.5	10	6.5	10	10	8.6
210	5.4	9	10.75	6.5	....	10.75	8.7
220	5.6	9	10.75	7	....	10.75	8.8
230	5.8	9.5	10.75	7	....	10.75	8.9
240	6	9.5	11.5	7	....	11.5	9.1
250	6.2	10	11.5	7.1	....	11.5	9.3
260	6.4	10	11.5	7.1	....	11.5	9.4
270	6.6	10.5	12.5	7.3	....	12.5	9.5
280	6.8	10.5	12.5	7.3	....	12.5	9.6
290	7	11	12.5	7.5	....	12.5	9.8
300	7.2	11	12.5	7.5	....	12.5	9.9

The position of the respondents with respect to drain tile and sewer pipe appears to be sound. These commodities differ considerably from brick. They are worth more per ton. They are also of such character that their loading per car is less. They are also more apt to be injured and damaged in transit. All of these facts argue for higher rates for such tile and pipe than for brick. Drain tile and sewer pipe are, therefore, omitted from the order herein. The proposition, however, that sand and lime brick should be included in the order is in point, since they are about of the same quality and character as other brick.

That the empty car mileage in connection with the brick traffic in this state is so much greater than the average empty car mileage for all traffic as to require special consideration, seems to us rather doubtful. While it is a fact that most of the brickyards in this state are located at points at which there is not a great deal of other freight traffic, it also seems to be a fact that most of them are found close enough to some main line along which empty as well as loaded cars are constantly passing, so that they can be supplied with cars in such a way as to prevent any unusual proportion of empty car mileage. However, the rates fixed in the order include a margin for contingencies.

The cost per unit of traffic is very much greater where the traffic is light than where it is heavy. Rates based upon cost would therefore be higher on branch lines than on the main lines. Ordinarily, however, it is to the best interest of all concerned that such inequalities should be eliminated and that the rates should be based on the conditions for the line as a whole.

The arguments on behalf of the Omaha road in support of the proposition that it be exempted from the order in this case, have received a great deal of consideration. After analyzing the facts and conditions involved, however, we have come to the conclusion that public interest requires that the order herein should be made general in this state. It may be stated here, however, that had in our judgment the conditions been such as to make such exemption proper, we should not have hesitated to provide for it.

The respondents were somewhat disposed to criticise the gradation of the rates with the distances in the former order. In doing so, they had probably forgotten that the way freight haul is relatively more costly than through hauls, and that it is one of the essentials of a rate schedule to provide for this difference. In the order this was done by increasing the movement cost for the first seventy miles. This increase in movement cost for the short or way freight haul in a continuous schedule has to be equalized by a correspondingly low movement cost for an equal distance beyond the way freight haul in order to bring the figures down to normal. The inequalities which the respondents had in mind are due to adjustments of this character. The principles upon which adjustments of this nature rest have been explained in detail in several decisions of this Commission.

Apparently the most serious objection that was raised against the former order was its anticipated effect upon competitive conditions or upon the rate situation elsewhere. While we are not entirely convinced that the arguments upon these points were pertinent, we feel that, considering everything, it may be proper for us to meet the requests of the respondents and raise to 2 cts. those rates which in the former order fell below this figure. Our position upon this point is somewhat strengthened by the fact that this change appeared to meet with the approval of at least most of the petitioners present. This change in the basic rates in the schedule will, of course, also cause a slight increase in the rest of the rates in the schedule, but, as this increase is relatively very small, it is probable that it will not materially affect the situation. It should not be assumed, however, that this change implies that a readjustment of this schedule may not again be necessary in order to place brick in the proper relation to other rates, should there be occasion for a general revision of the rates in this state.

It is Therefore Ordered, That the order of this Commission in the instant case, dated July 10, 1911, be modified to read as follows:

It is Ordered, That the respondents in this case, the Chicago, Milwaukee & St. Paul Railway Company, the Chicago & North Western Railway Company, the Chicago, St. Paul, Minneapolis & Omaha Railway Company, the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, the Green Bay & Western Railroad Company, the Chicago, Burlington & Quincy Railroad Company, the Northern Pacific Railway Company, and the Illinois Central Railroad Company, discontinue the rates at present in effect upon their respective lines upon shipments of brick, for distances up to and including 300 miles, and substitute therefor the following rates:

For distance of						Rate in cents per 100 lbs.
10	miles	or	under			2.00
15	miles	and	over	10	miles	2.15
20	"	"	"	15	"	2.30
25	"	"	"	20	"	2.45
30	"	"	"	25	"	2.60
35	"	"	"	30	"	2.75
40	"	"	"	35	"	2.90
45	"	"	"	40	"	3.05
50	"	"	"	45	"	3.20
55	"	"	"	50	"	3.35
60	"	"	"	55	"	3.50
65	"	"	"	60	"	3.65
70	"	"	"	65	"	3.80
75	"	"	"	70	"	3.95
80	"	"	"	75	"	4.10
85	"	"	"	80	"	4.25
90	"	"	"	85	"	4.40
100	"	"	"	90	"	4.55
110	"	"	"	100	"	4.65
120	"	"	"	110	"	4.75
130	"	"	"	120	"	4.85
140	"	"	"	130	"	4.95
150	"	"	"	140	"	5.05
160	"	"	"	150	"	5.15
170	"	"	"	160	"	5.25
180	"	"	"	170	"	5.35
190	"	"	"	180	"	5.45
200	"	"	"	190	"	5.55
210	"	"	"	200	"	5.75
220	"	"	"	210	"	5.95
230	"	"	"	220	"	6.15
240	"	"	"	230	"	6.35
250	"	"	"	240	"	6.55
260	"	"	"	250	"	6.75
270	"	"	"	260	"	6.95
280	"	"	"	270	"	7.15
290	"	"	"	280	"	7.35
300	"	"	"	290	"	7.55

IT IS FURTHER ORDERED, That the respondents named above make effective between their various lines, for distances up to and including 300 miles, joint rates one cent per 100 lbs. higher than the rates named in the foregoing table.

All rates included in this order are to be subject to the present rules regarding minimum weights.

GEORGE FOX ET AL.
vs.
PLATTEVILLE, REWEY AND ELLENBORO TELEPHONE COMPANY,
IN RE APPLICATION OF THE PLATTEVILLE, REWEY AND ELLENBORO TELEPHONE COMPANY FOR AUTHORITY TO INCREASE RATES.

Submitted March 31, 1911. Decided Aug. 15, 1911.

Petition alleging certain irregularities and discriminations on the part of respondent. Under the application for authority to increase rates all the matters included in the petition are proper subjects of consideration and the effect on the jurisdiction of the Commission of the fact that four of the petitioners withdrew their names, leaving the number of signers less than twenty-five, is not decided. The valuation for the purposes of this case, to include the change to a full metallic system, is fixed at $43,740. The receipts and expenses are discussed and the normal operating expenses determined.

It is Ordered: That all discrimination in rates cease; that pending the change to a full metallic system the present rate of $1 per month shall remain in effect; that on the completion of such improvement the company shall put in effect the schedule of rates herein named.

The complaint of George Fox and twenty-five other persons alleges, in substance, that the respondent Platteville, Rewey & Ellenboro Telephone Company has not adopted or filed in its office, as required by law, a schedule of rates, tolls and charges for stockholders and for renters who are not stockholders; that the respondent in practice does not charge stockholders any rates for the use of telephones, but that such stockholders usually pay for the use of their telephones about $5 per year; that in a specific instance the respondent company has set poles and strung half a mile of wire for one prospective subscriber free of charge, and refused to do the same for another prospective subscriber, and has even refused to connect at all with certain persons who desired connections with its line; that no distinction is made in rates between single and party line telephones, which in itself is a discrimination; that the respondent has charged different rates at different times without filing notice of the change with the Commission, as required by law; and that the respondent has failed to keep its accounts as prescribed by law, so that it is impossible to ascertain from its accounts, as they are kept, what the actual financial transactions of the company are.

The answer of the respondent telephone company alleges that the respondent is a corporation engaged in furnishing telephone service for its stockholders and incidentally for the business and professional people of Platteville, and that the respondent is not sure that as such corporation it is a public utility subject to the provisions of ch. 499, Laws of 1907, as amended; and that the corporation was organized for the mutual benefit of its stockholders and not for dividends. The respondent admits that its stockholders who have telephones pay therefor about the sum of $5 and not exceeding $10 per year, but in such cases the subscribers themselves are the owners of the telephones; admits the case mentioned in the complaint where wire was strung free of charge for a certain subscriber, but denies that poles were put up at the respondent's expense for this subscriber, as the poles had been placed previously; admits that single line and party line telephones are charged the same rate in the city of Platteville, but alleges that persons placed on party lines were aware of this fact when their service commenced; and admits that it has no schedule of rates, as such, on file in its office, but alleges that the same may be found in the books and papers of the respondent which are open to its subscribers. Wherefore, the respondent company prays that the petition be dismissed

The application of the Platteville, Rewey & Ellenboro Telephone Company for authority to increase its rates was made shortly before the hearing was held upon the complaint above set forth. It alleges that the present rates to subscribers or renters are $1 per month for each telephone; that such rates are not an adequate schedule for the service rendered and are insufficient to keep up repairs, expenses and necessary improvements; and requests that the company be permitted to put into effect the following schedule:

1. Rental of residence party telephones, each	$1.00 per mo.
2. Rental of residence single telephones, each	1.25 per mo.
3. Rental of business party telephones, each	1.50 per mo.
4. Rental of business single telephones, each	2.00 per mo.
5. For each and every additional telephone, the same rate as scheduled above in Nos. 1, 2, 3, and 4.	

The hearing upon both the complaint and the application was held at Platteville, March 30 and 31, 1911. *George Fox* appeared for the complainants, *Gardner & Gardner* for the Platteville, Rewey & Ellenboro Telephone Company, and *R. A. Goodell* for the city of Platteville.

Shortly before the hearing four of the persons who signed the original petition against the Platteville, Rewey & Ellenboro Telephone Company requested that their names be withdrawn from the petition. Whether this is a proper request under the circumstances, since it would result in leaving the number of signers smaller than that required by law for the instituting of a proceeding against a public utility before this Commission, need not be decided here, for all the matters included in the complaint are proper subjects of consideration in the rate increase case. Accordingly, this proceeding will be treated from this point on only as an application for authority to increase rates.

Very little information of any value in deciding upon this application was submitted at the hearing. So far as the testimony shows, few of the facts usually presented in such cases as the present were known to the representatives of the applicant who testified. The reports of the applicant are also unsatisfactory, as later discussion will show. However, with such facts as can be obtained from the reports and from comparison with other companies of similar character, the Commission will endeavor to arrive at as nearly correct a solution of the case in hand as possible.

In the first place, it is to be noted that the applicant at present charges renters $1 per month, but names no charge at all for stockholders, who, on the other hand, pay an assessment of $5 to $10 per year to meet the expenses of the company, and who also furnish their own telephones. The practice of charging stockholders different rates than are charged to other users of the telephone service, is clearly illegal, and has been condemned in no uncertain terms by this Commission. In the decision *In re Free and Reduced Rate Telephone Service,* 2 W. R. C. R. 521, to which the applicant, among other telephone companies, was ordered to conform, the Commission said, on page 544:

"Finding 5. It is unlawful to exact a higher rate from subscribers who are not stockholders, directors or officers than from subscribers who are stockholders, directors or officers."

This requirement conforms not only to the law, but to proper economic and logical principles as well. The dictates of good business policy require that stockholders should look for their compensation to dividends declared out of the net revenue remaining after all expenses have been met, and should not conduct the corporation at a loss by furnishing the commodity produced to themselves free and making up the loss by assessments. And where, as in this case, the rights of other persons not stockholders are concerned, the impropriety of the applicant's practice is even more apparent, for the non-stockholder can never be satisfied that he is bearing only his fair proportion of the expenses of the company.

Nor does the fact that stockholders own the instruments which they use furnish any reason for a difference in rates as between them and the non-stockholders. This principle is plainly stated in the law itself, which reads as follows:

> "Sec. 1797m—90. It shall be unlawful for any public utility to demand, charge, collect or receive from any person, firm or corporation less compensation for any service rendered or to be rendered by said public utility in consideration of the furnishing by said person, firm or corporation of any part of the facilities incident thereto; provided nothing herein shall be construed as prohibiting any public utility from renting any facilities incident to the production, transmission, delivery or furnishing of heat, light, water or power or the conveyance of telephone messages and paying a reasonable rental therefor. * * * ."

What the rental to be paid to subscribers for the use of telephone equipment owned by them shall be, is a matter to be determined in the first instance by the telephone company itself and not by the Commission. Any injustice in this rental, as fixed by the company, may be made the subject of complaint to the Commission, the same as other practices of the company. But as to the rates themselves, there can be no question that all users of the same class of telephone service must pay the same amount, and it is upon this basis that the financial operations and rates of the applicant will be investigated in this proceeding.

The applicant, in its report for 1911, states that it has 976 subscribers, and that on June 30, 1910, it had 918 subscribers. These subscribers are not apportioned in the report among the various classes of service, nor was the president of the company able at the time of the hearing to give any such apportionment.

A careful checking of the August, 1910, directory of the applicant, which was submitted as an exhibit at the hearing, shows the number of subscribers, divided as accurately as possible among the different branches of service, to have been as follows:

Single line business	103
Party line business	53
Single line residence	155
Party line residence	153
Rural	450
Total	914

The applicant's report shows that the additions during the year 1910–1911 were upon city and not rural lines; and, assuming that the added telephones in each class bear the same proportion to the total number added as the telephones already installed in that class bear to the total already installed, the number and classification of subscribers of the applicant on June 30, 1911, were about as follows:

Single line business	116
Party line business	60
Single line residence	174
Party line residence	172
Rural	450
Total	972

The representative of the applicant stated at the hearing that one of the reasons for the application was the applicant's desire to install metallic return service in place of the present grounded return service. Some of the rural lines of the applicant extend, for several miles, close to the lines of an electric power development company, and the resulting electrical disturbance on the lines, it is said, will be largely eliminated by the establishment of the metallic service. In addition, it is commonly recognized that the metallic return is conducive to better service in general than the grounded circuit, and there is hardly another city in the state of the size of Platteville in which the telephone lines are not, in part at least, upon a metallic return basis. It is therefore entirely proper that the applicant should undertake the improvement of its system by the use of the metallic return, and that the increase in rates, if any, made necessary by such additional investment, should be authorized.

The applicant's plant investment was stated at the hearing to be $35,030, as represented by shares of stock. This valuation amounts to $36.04 per subscriber, which seems to be considerably less than the value of most telephone plants of similar size in the state, but is not, perhaps, far out of the way when it is considered that the applicant's plant is upon a grounded circuit. The representative of the applicant was unable to give any estimate as to the cost of changing from the grounded to the metallic system, but it is probable that if the valuation of the plant is increased by one-fourth, the cost of making the change will be fully covered. The resulting valuation of $45 per subscriber, or $43,740 in all, though not as high as the valuation for the average plant the size of the applicant's, will undoubtedly be fair, for the purposes of this case, for a number of reasons. Among these reasons, perhaps the most important is that the applicant's investment does not include the telephone instruments themselves, practically all of which, it seems, are either owned by the users themselves or leased from the Wisconsin Telephone Company. The facts as to the leasing of instruments from the Wisconsin Telephone Company were not mentioned at the hearing, but are obtained from an examination of the applicant's contract with that company. A further fact of importance in this connection is, that the applicant's system is almost as largely a rural as a city system, and that its rural lines are heavily loaded, averaging nearly fifteen subscribers to the line, so that the cost of constructing the pole and wire line for a single subscriber is much less than it would be for lines serving but one or two subscribers each.

As to the earnings and expenses of the applicant, the data at hand are very meager. The report for 1909 was so incomplete that it could not be tabulated in the Commission's report for that year; no report at all appears in the Commission's files for the year 1910; and the report for 1911, while much more complete than that for 1909, is so unusual in certain items that its accuracy is much to be doubted. The 1909 report, as submitted by the applicant, was as follows:

RECEIPTS:	
Rent of phones	$3,195.20
Toll on line	2,034.20
Assessments	2,150.00
Extras sold	276.00
Shares sold	185.60
Old switch board	90.00
Pole service	25.00
Total	$7,956.00

Expenditures:	
Switch board service	$3,060.00
Labor	300.00
One switch board	1,030.00
Extras and supplies	1,487.00
Paid Wis. Tel. Co. toll for 1 year	2,079.00
Total	$7,956.00

The indiscriminate inclusion of capital charges and credits as well as those belonging to operation, the lack of separation into proper accounts, and the fact that the earnings and expenses are made to come out exactly even, cast a great deal of doubt upon the trustworthiness of the above report for the purposes of this case.

The 1911 report of operating earnings and expenses is as follows:

Total operating revenues	$13,969.13
Operating expenses:	
Central office expense	$3,569.75
Wire plant expense	1,198.15
General expense	5,338.62
Undistributed:	
Insurance	56.00
Stores department expense	112.65
Utility equipment expense	2,946.29
Total of above expenses	$13,221.46
Taxes	28.19
Total operating expense	$13,249.65
Net operating revenue	$719.48

A glance at this report shows that the items of general expense and utility equipment expense can hardly represent what those accounts are intended to represent. Taking the year 1909 as an example, only one plant in the state, that at Milwaukee, reported general expenses as high as those reported by the applicant; while the account utility equipment expense often is not included at all in telephone company reports, and is undoubtedly used in this case to dispose of various kinds of expense not classified under other heads. In the absence of any information as to the true character of these two accounts, and as to whether the inaccuracies which are so apparent as to them are also to be found in the other accounts, we are forced to rely upon a comparison of expenses for other plants similar to that at Platteville, in order to determine about what the normal total operating expenses of the applicant should be. Table I shows the number of subscribers and total operating expenses for 1910 of several plants in the state, about the size of the plant in question, together with the expense per subscriber. Only the totals are given, for the reason that it would be impracticable to attempt a comparison of the individual accounts of these companies with the individual accounts of the applicant as reported by it.

TABLE I.

OPERATING EXPENSES OF TELEPHONE PLANTS.

Company.	Subscribers.	Operating expenses, excluding taxes.	Expense per subscriber.
Antigo Tel. Co.	817	$7,070 80	$8 65
Ashland Home Tel. Co	1,238	11,715 89	9 48
Beloit Home Tel. Co	1,090	10,563 37	9 69
Citizens' Tel. Co., Sheboygan	1,470	14,065 29	9 57
Interurban Tel. Co., Sun Prairie	919	6,127 15	6 67
Mineral Point Tel. Co	725	5,313 76	7 19
Milton & Milton Jct. Tel. Co	926	4,236 20	4 57
Monroe Co. Tel. Co., Sparta	813	4,781 28	5 88
Portage Tel. Co.	805	6,036 15	7 50
Wisconsin Tel. Co., Appleton	847	9,194 25	10 85
" " " Beaver Dam	959	6,684 51	6 97
" " " Chip. Falls	739	6,769 00	9 16
" " " Janesville	1,273	11,867 95	9 32
" " " Manitowoc	1,022	8,643 32	8 46
" " " Marinette	1,102	11,610 04	10 54
" " " Menomonie	802	7,062 79	8 81
" " " Neenah	1,085	10,724 26	9 88
" " " Stoughton	745	5,026 58	6 75
" " " Watertown	715	7,145 68	9 99
" " " Waukesha	883	9,991 40	11 32
Average	949	....	$8 56
Applicant, (reported expense)	972	$13,221 46	$13 60

Table I shows that in 1910 the average operating expenses of the companies included in the table were about $8.56 per subscriber. The reported expense of the applicant for 1911 is $13.60 per subscriber. Whether the great excess of the applicant's expense over the average expense is due to the improper charging of the operating expense account with items belonging to construction, or to extravagance on the part of the applicant, or to abnormal conditions during the year 1910–1911, we have no way of knowing.

As a matter of fact, it would seem that the applicant's expenses should be lower, rather than higher, than the average given above. The telephone companies listed in table I are almost exclusively city systems. Whatever rural subscribers they may have, are in most cases so few as to be almost negligible. The applicant, on the other hand, is devoted almost as much to rural as to city service. Out of 972 subscribers 450 are on rural lines. A study of the applicant's directory indicates that it has thirty-one rural lines, which thus average between fourteen and fifteen subscribers to the line. As a matter of fact, by actual count, twenty of these lines have fifteen or more subscribers, and one has twenty-one. This large proportion of rural subscribers, and the heavy loading upon each line, should reduce the expenses per subscriber considerably below those for the average city telephone company. With fifteen to twenty subscribers upon a line, the amount of business which will be done without making any demand upon the central office at all is likely to be very considerable. The extra cost of maintaining rural lines, due to the extent of territory covered, must be more than offset, when the expense per subscriber is taken as a unit, by the large number of subscribers upon a line. An actual comparison of the total operating expenses of a number of rural lines, as given in the decision of this Commission *In re Application of the Ozaukee-Washington Telephone Company,* 7 W. R. C. R. 428, shows the average expense for eighteen such lines to be about $6.76 per subscriber. Furthermore, an examination of the 1909 report of the applicant will show that, although it obviously contains some capital charges, the expense account as reported is less than $8,000 per year. These and other facts lead us to the conclusion that the operating expenses, excluding taxes, of the applicant should normally not exceed about $8.25 per subscriber, or, upon the basis of the present number of subscribers, about $8,019 per year.

This estimate of the normal operating expenses of the applicant may be roughly checked up in another way. The applicant reports that the salaries and wages paid by it are as follows:

Superintendent	$65	per month
4 operators at $30	120	"
1 maintenance man	100	"
1 clerk	25	"
Total	$310	per month

The total superintendence and labor cost thus shown amounts to $3,720 per annum. In general, the reports of telephone companies show their superintendence and labor cost to be fully half of the entire operating expense. The labor cost of the applicant, as reported, can be more than doubled without exceeding the $8,019 allowed above; and when it is considered that, with the labor item excluded, the applicant will have $4,299 left for cost of material, rents, insurance, etc., it does not seem at all unreasonable to limit the expenses, for the purposes of this case, to the figure named.

With the operating expenses reduced to what seems to be about a normal figure, and with interest and depreciation allowed each at the rate of 7 per cent upon a plant valuation, under the metallic return system, of about $43,470, it is possible to arrive at an estimate of the financial operations of the company under its proposed system of rates. In arriving at the earnings, under this estimate, it is necessary to find not only the earnings from subscribers' rentals, but also from connecting lines and from non-subscribers' toll fees. The applicant's report makes no separation of its earnings so as to show these amounts. The testimony shows that the applicant charges the Platteville & Cornelia Telephone line $5 per year per subscriber for switching service and maintenance of pole line in Platteville; since this line has 45 subscribers, the total revenue under this arrangement should be $225. According to the applicant's contract with the Wisconsin Telephone Company, the latter company pays the applicant $25 per month, or $300 per year, for service in connection with the toll business handled by the applicant. In addition, a line known as the Log Cabin line, with twelve subscribers, pays the applicant $1 per telephone per year, or a total of $12. There is no information on which to base an estimate of the earnings from non-subscribers, who, according to the company's schedule, as filed with the Commission, pay 15 cts. per message on all parts of the line; but if the total from this source, from extension telephones and from such miscellaneous items as the pole line rental which appears in the company's 1909 report, is placed at $100 per year, it will probably not be too high. Upon the basis of the foregoing calculations, the financial operations of the company under the proposed rates would be about as follows:

Revenues:	
116 single business telephones at $24	$ 2,784
60 party business telephones at $18	1,080
174 single residence telephones at $15	2,610
172 party residence telephones at $12	2,064
450 rural telephones at $12	5,400
Earnings from connecting lines	537
Miscellaneous earnings	100
Total revenues	$14,575
Expenses:	
Operating expenses, except taxes	$ 8,019
Taxes	28
Depreciation, 7 per cent on $43,740	3,062
Interest, 7 per cent on $43,740	3,062
Total expenses	$14,171

The above statement indicates a margin of $405 above the 7 per cent interest allowance, or an actual return for interest of not quite 8 per cent. This is a little more than would seem to be necessary under the circumstances, and at the same time the increase proposed for single line business telephones appears to be somewhat out of proportion to the other increases. If the single line business rate is placed at $21 instead of $24 per year, the revenue from this source will be about $2,436 and the total revenue about $14,227, or about $56 greater than the estimated expenses. This margin of $56 does not seem too high when it is considered that with the change from a flat rate for all subscribers to a rate differing as between single line and party line subscribers, it is probable that a number of subscribers now using single line telephones will change to party lines at the lower rates.

The rates proposed in the application include a rate for extension telephones, equal to the rate for the telephone from which the extension is made. It was explained at the hearing, however, that the intention was to make the extension rates less than those for the original telephones, but proportionate to them. It does not appear whether or not the applicant now has any such extensions. The representative of the applicant at the hearing suggested that the extension rate should be about half the regular telephone rate. This amount, or a little less, would seem to be about the usual proportion; and if the rate for extension telephones is fixed at $9 per year for business extensions and $6 per year for residence extensions, these installations will probably yield about their proper share of the revenues of the company.

The rates, as given above for regular installations and extensions, are based upon the assumption that the applicant's system is equipped with the metallic return, which, it is estimated, will increase the value of the plant quite considerably over its value at the present time. It would be improper, therefore, for the new rates to be made effective until the metallic system is installed. The following statement shows what would be the normal financial operations of the applicant at the present time if instead of discriminating between stockholders and non-stockholders all users were charged the published rate of $12 per year, and if the value of the plant is assumed to be $35,000, as reported, with the present grounded return system in use:

REVENUES:	
972 telephones, at $12 per year	$11,664
Other earnings, as in preceding table	637
Total revenues	$12,301
EXPENSES:	
Operating expenses, as in preceding table	$ 8,019
Taxes	28
Depreciation, 7% on $35,000	2,450
Total expenses	$10,497
Surplus available for interest	$1,804
Or, on $35,000 valuation	5.15%

The return of about 5.15 per cent which the present rates should yield the applicant, while not as high as it perhaps is permanently entitled to, is not so low that the present rates require modification, in view of the impending improvements to the system and the establishment of the new rates when such improvements are completed. Until the establishment of the metallic circuit, therefore, the rates of the applicant will be left as they are at present, with the understanding that all discrimination between stockholders and non-stockholders, and all other instances of free or reduced rate service, a few of which were mentioned in the testimony, shall immediately be discontinued, and the rate of $12 per year shall be uniform throughout the applicant's system.

It may be remarked at this point that, owing to the lack of definite information at almost all points of this investigation, and the necessity of making estimates, it is by no means certain that the conclusions reached are in all respects accurate. If the applicant considers that it has been harshly dealt with, its remedy is to present to the Commission such information as the law requires it to have available, so that a careful analysis of actual instead of estimated operating conditions can be made. The accounting system prescribed by this Commission for telephone companies has been in use throughout the state for over two years, and no reason has been shown why the applicant should not from this time forth keep its accounts as required by law, and as accounts are kept by telephone companies throughout the state in cities the size of Platteville.

IT IS THEREFORE ORDERED, That the applicant, the Platteville, Rewey & Ellenboro Telephone Company, be and the same is hereby authorized to discontinue its present system of rates and to substitute therefor the following rates:

For single line business telephones	$21 per year
For party line business telephones	18 per year
For single line residence telephones	15 per year
For party line residence telephones	12 per year
For rural party line telephones	12 per year
For business extension telephones	9 per year
For residence extension telephones	6 per year

Provided, however, that the rates named in this order shall not be effective until the entire system of the applicant has been equipped to provide a metallic return in place of the present grounded return.

TOWN OF WAUWATOSA
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 20, 1911. Decided Aug. 16, 1911.

Petition for the removal of two bridge piers constructed in the highway by respondent in making an overhead crossing over the Watertown plank road, for the reason that they narrowed the roadway, obstructed the view, and interfered with the natural drainage.

Held: That conditions do not warrant change in construction. Petition is dismissed.

The petitioner is a municipal corporation of Milwaukee county, state of Wisconsin. The petition is signed by the town board of supervisors and sets forth that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that said town is very thickly populated and contains many large quarries and manufacturing industries, and that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicles; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway in said town of Wauwatosa known as the Watertown plank road, and that said highway is subjected to a very heavy traffic both by team and automobile; that at the point at which said Chicago & North Western Railway Company crosses said highway it does so by overhead bridge or viaduct; that the said Chicago & North Western Railway Company, in the construction of said viaduct, has placed two piers in said highway which are an encroachment upon said highway and an obstruction thereon and an interference with the usefulness of said highway, and that the public welfare and safety require that the same be removed; that the said viaduct or bridge is not completed and that the same can now be changed without serious inconvenience, expense or loss to the said Chicago & North Western Railway Company, and that the said Chicago & North Western Railway Company in the construction of said bridge or viaduct has interfered with the natural and artificial drainage of said highway at this point. Wherefore, petitioner prays that said Chicago & North Western Railway Company be required to remove the encroachment and obstructions placed by it upon said Watertown plank road and also be required to make such drains or sewers at such point as the Commission may determine.

In its answer the respondent states that it is the intention to have what is known as the Watertown plank road, where it crosses the tracks of the Chicago & North Western Railway Company, put in first class condition and to be made in every way satisfactory.

The hearing was held on Feb. 18 and 20, 1911, in the town hall in the city of Wauwatosa. *G. J. Davelaar* appeared for the petitioner. The respondent was represented by *W. G. Wheeler,* who appeared only on the first day of the hearing.

The testimony of all the witnesses shows that the railway company, in constructing its bridge over the highway in question, placed two of the supporting piers or pedestals within the dedicated highway at distances varying from ten to eighteen feet from its northern fence line. Witnesses for the petitioner stated that the location of the piers seriously interfered with the natural drainage, but the company's assistant chief engineer testified that there had been no interference with the drainage at this point. The principal objection of the petitioner to the erection of the bridge piers in the highway, as testified to by the witnesses, is the belief that they materially obstruct the view of approaching trains over the Chicago, Milwaukee & St. Paul Railway, whose tracks cross the same highway at grade a short distance west of the site under complaint, thus making the grade crossing of the Chicago, Milwaukee & St. Paul Railway more dangerous to vehicles traveling west. A secondary objection was expressed by the town officials to the narrowing of the highway, as it would interfere with future improvements of the thoroughfare, plans for which have been under consideration by the town board for some time. Testimony shows that the width of the highway between fence lines at this point is sixty-one feet, but that the traveled part of he roadway is about twenty-seven feet wide. The distance between the bridge piers on the northern side of the highway and the railroad abutment on the southern fence line of the highway was testified to as being forty-eight feet eight inches. The clearance between the highway and the bottom of the bridge is thirty-three feet.

Since the hearing two examinations have been made on the ground by an engineer of the Commission, whose report gives additional information as to the physical conditions of the locality. Reviewing the testimony and the facts cited by our engineer, it appears that the Chicago, Milwaukee & St. Paul grade crossing is between three and four hundred feet from the overhead bridge of the Chicago & North Western Railway Company, and that intermediate thereto is a bridge crossing Underwood creek and having a width of eighteen feet. The visual conditions on the north side of the highway have not been materially changed by the erection of the piers, as the view is chiefly obstructed by a number of trees located in the angle between the two railroads, which appear to be on the Chicago & North Western Railway Company's right of way. It is recommended that these trees be removed.

It is true that the bridge abutment and embankment obstructs the view to the south and west as a vehicle approaches the grade crossing from the east, but the distance is sufficient to give ample view of approaching trains to any one after passing under the overhead tracks and to stop whenever necessary. As an automatic alarm has lately been installed at the Chicago, Milwaukee & St. Paul Railway Company's crossing, much of the danger that heretofore existed at that point has been removed.

The bridge over Underwood creek appears to be of sufficient width to take care of the present traffic. It is an old structure and will doubtless soon be replaced by a wider one. Several highway bridges in the vicinity were examined by the Commission's engineer, but none were found to exceed twenty-five feet in width. Should a forty foot bridge be erected at this point, the opening under the Chicago & North Western Railway Company's tracks is sufficiently wide to permit a traveled roadway of the same width.

Considering all of the facts in the case, the objections made by petitioner to the location of the piers in question do not seem to be of sufficient merit to justify any action of this Commission.

The testimony of petitioner's witnesses that the drainage has been interfered with by the railway company's operations, led to a close inspection of the highway by the Commission's engineer, who reports that at the time of his examination considerable water was flowing down the "dry run" and the passage along the highway was perfectly free; without obstruction. It therefore appears that the condition complained of by petitioner no longer exists.

In view of the facts as above set forth, the petition is hereby dismissed.

TOWN OF WAUWATOSA
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 18, 1911. Decided Aug. 17, 1911.

Petition for proper protection at the Lisbon ave. crossing and for a sufficient temporary crossing during construction.

It is ordered: That respondent install an automatic audible alarm with illuminated sign and construct and maintain the crossing at a width of 32 feet.

The petitioner is a municipal corporation of Milwaukee county, state of Wisconsin. The petition is signed by the town board of supervisors and sets forth that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that said town is very thickly populated and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicle; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway in said town of Wauwatosa known as Lisbon avenue; that petitioner is informed it is the intention of said railway company to cross said Lisbon avenue at grade and that said grade crossing will be extremely unsafe and dangerous to travelers over such highway. Petitioner further alleges that said railway company is now providing, and has been during said period of construction, a very inadequate temporary roadway across its work of construction which is blockading and obstructing the traffic upon said highway and is dangerous to the public safety and welfare; wherefore, petitioner prays for an order requiring said Chicago & North Western Railway Company at said Lisbon avenue to construct a temporary crossing of sufficient width and substantiality to carry the traffic at such point with due regard to public safety; and that the Commission further determine and order the said Chicago & North Western Railway Company to erect gates at such crossing when said railroad extension is completed; and for such other and further relief as the Commission may determine.

The respondent, answering the complaint, alleges that the crossing herein mentioned will not be any more unsafe or dangerous to travelers than the ordinary railroad crossing; denies that the temporary crossing of respondent is inadequate, but on the contrary alleges that it is wholly adequate and safe; and alleges that the company is willing to properly protect such crossing when said railroad extension is completed in such manner as the Commission may direct.

The hearing was held in the town hall in the city of Wauwatosa on Feb. 18, 1911. *G. J. Davelaar* appeared for the petitioner and *W. G. Wheeler* for the respondent.

Testimony shows that the Chicago & North Western Railway crosses this highway at about the center of the northwest quarter of section 7. The highway is an important one; it starts at a point in the city of Milwaukee and runs in a northwesterly direction through the town of Wauwatosa. The town clerk testified that it has a width of sixty-six feet; according to the testimony of the town supervisors the roadway is thirty-two feet wide at the Chicago & North Western crossing. It is a very heavily traveled road, the traffic being principally farm teams taking produce to Milwaukee and returning with merchandise, grain and manure. Several witnesses testified that previous to the filing of the complaint in this case, the temporary crossing provided by the railway company was a very dangerous one and inadequate for public travel. One of the witnesses stated that he with two other persons met with an accident at the crossing during the course of excavation by the railway company, which was occasioned by improper an insufficient grading of the highway at the point of intersection with the excavated portion of respondent's right of way. The accident occurred in the evening, mainly due to the absence of lights, which should have been provided by the railway company and which would have indicated the nature of the crossing. The three occupants of the buggy were thrown out of the vehicle and slightly injured, while the buggy and harness were broken to pieces. The town officials testified that the report of this accident to them by the witness just mentioned was the first information they had of the existance of the crossing in question. Later the railway company made some improvement of the crossing by laying planks across the track, but at the time of the hearing witnesses for the petitioner stated that such planks did not form a crossing wide enough to permit two teams to pass each other. It was the opinion of witnesses that, owing to the heavy traffic on the highway and that the freight yards of the railway company will be located in the vicinity, public travel will be dangerous and unsafe at this crossing unless protected by gates or signals.

Subsequent to the hearing an engineer of the Commission made two inspections of the crossing in question and submitted a report, from which it appears that the freight yards of the railway company will be located just north of the crossing, and the yards are so arranged that switching will not be done on the main line. Only the main tracks pass over Lisbon avenue and at the present time the railway traffic consists only of work trains. The highway approaching the railroad crossing from both sides is practically level, but on the south side of the east approach the view is obstructed by several trees, and on the south side of the west approach by a thick hedge. On account of these obstructions some form of protection should be provided and it would appear that an automatic alarm should be sufficient for the present. Traffic on the railway will doubtless be light for several months, and the conditions at this time are not such as to justify a flagman.

IT IS THEREFORE ORDERED, That the respondent, the Chicago & North Western Railway Company, install, operate and maintain at the intersection of its Milwaukee-Sparta extension with Lisbon avenue in the town of Wauwatosa an automatic audible alarm with an illuminated sign in addition to the usual audible alarm.

IT IS FURTHER ORDERED, That the respondent, the Chicago & North Western Railway Company, construct and maintain said highway crossing at a width of thirty-two feet.

Sixty days is deemed a reasonable time within which to comply with these orders.

CITY OF JANESVILLE
vs.
JANESVILLE WATER COMPANY.

Decided Aug. 17, 1911.

Petition alleging that the rules, regulations and rates of respondent are unreasonable, unjust and exorbitant. Objection was made to the jurisdiction of the Commission on the ground that the franchise granted respondent was a contract and not merely a permit. This objection was overruled and the Commission assumed jurisdiction. Subsequent to the filing of the petition the respondent changed a number of its rules and removed some of the causes of complaint.

The matters determined in these proceedings are:

(1) Whether services should be installed at the expense of the consumer or the company.

(2) Whether meters should be owned by the consumer or the company.

(3) Whether or not a portion of the water furnished by the company is taken from the Rock river.

(4) Whether certain extensions ordered by the petitioner should be made.

(5) The reasonableness of the rates.

(6) The reasonableness of the rule that consumers whose water supply has been shut off for non-payment, or for failure to comply with the rules of the company, must pay a charge of one dollar in order to have the water again turned on.

The valuation of the property is discussed and allowance is made as a part of the plant investment for discount on bonds during construction; also for going value; such value for the purposes of this decision, exclusive of meters and services, is found to be $250,000. The operating expenses are discussed and normal operating expenses fixed. The salaries paid to the general officers are found excessive and are reduced so far as the operating expenses are concerned. Such expenses are apportioned between fire and general service.

Held: (1) That hereafter services from the main to the curb shall be installed at the expense of the company.

(2) That meters shall be owned and installed by the company and that in cases where the consumer now owns the meters, the company shall either buy the meters or pay the amounts herein named as rental. That it is the duty of the company to maintain meters whether owned by it or by the consumer.

(3) That no evidence or trace is found of the company taking any water from the Rock river.

(4) That one extension ordered by the petitioner be constructed in not less than sixty days; that two other extensions be made in case petitioner takes affirmative action in relation to same; such two extensions being for fire protection only, the added amount to be paid by the city is fixed and determined.

(5) The amount to be paid by the city for fire protection and sewer flushing is materially increased. The flat rates remain the same as at present with slight changes. The meter rates as fixed herein amount to a material reduction. All water used in schools, public buildings, churches, etc., shall be paid for at the schedule rate.

(6) That the rule providing that water shall be shut off for non-payment of rates or failure to comply with the rules and regulations of the company, and that a charge of one dollar shall be paid before the water is again turned on, is reasonable.

There are two complaints in this matter, entered, respectively, on Jan. 21, 1909, and April 19, 1910. The matters complained of cover nearly all features of the management and operation of the water company. The complaint of Jan. 21, 1909, contains the following charges:

1. That prior to and during the month of December, 1908, the water company installed a number of meters in buildings which were equipped for lawn sprinkling, and charged the owners of such buildings $15 for a meter and shut off the water supply in cases where owners of such buildings refused to pay for meters.

2. That when the owners of such buildings refused to allow the company to install meters, the company disconnected the sill-cock, through which water had been drawn for lawn service, from the piping in the building, thereby shutting off the lawn service.

3. That the water company refused to allow consumers to purchase meters, except from the company.

4. That the water company compelled owners of flats, stores and office buildings to either install a meter at their own expense and buy such meter from the company, or pay a meter rental of 65 cts. per quarter in cases where the meter was installed at the expense of the water company.

5. That where meters are installed the company charges a flat rate of $2.50 per quarter, in addition to the meter rental, for each house, apartment or store for any amount of water consumed less than 7,000 gallons, and that for all amounts over 7,000 gallons the regular meter rates are charged.

6. That the company has for a long time and does now compel consumers to pay the cost of putting in services, including the cost of labor, pipe, tapping the main, and the stop-cock.

7. That the company pumps water directly from the Rock river, and that such water is impure and unfit for human consumption.

8. That all of the rules, regulations and rates of the water company are unreasonable, unjust and exorbitant, and that the company enforces its rules, regulations and rates by shutting off the water supply of any patron who refuses to observe the rules or pay the rates as charged, and refuses to again turn on water in such cases until the consumer complies with the demands of the company and pays $1 extra.

The complaint of April 19, 1910, alleges:

1. That the common council of Janesville passed an order directing the water company to make extensions of its mains as follows:

(a) From the present terminus at the Grant school on Pleasant street, westerly eight hundred feet on said street.

(b) From its present location on Eastern avenue at the corner of McKay boulevard, west on Eastern avenue to Center avenue.

(c) From its present terminus on Bluff street at the intersection of Fourth avenue south on Bluff street to the center line of Peases' court and east on Peases' court four hundred feet.

(d) On St. Mary's avenue from the center line of Prairie street to Milton avenue and connect the same with the water main on Milton avenue.

(e) From the present terminus of its mains on Walker street, westerly to the corner of Sutherland and Walker streets, and connect with its mains at that point.

(f) From Madison street to Mineral Point avenue, on North River street.

(g) A four-way hydrant at the south-east corner of Race and Academy streets.

(h) On Lincoln street from Galena street to Washington street.

2. That the water company has refused and neglected to lay mains and make extensions as ordered.

3. That it is necessary that the water company make such extensions in order to serve the public's needs and requirements, that a large number of the residents upon the streets over which extensions were ordered laid are desirous of securing the service of the water company, and that the extensions are needed for fire protection.

This complaint also includes the charge made in the original complaint, that the company refuses to lay the service pipes at its own expense. An amendment to the complaint was made on April 22, 1911, asking that the company be compelled to extend its mains from the present terminus on Milwaukee avenue, at the corner of Garfield avenue, east on Milwaukee avenue four hundred feet.

Hearing on the original complaint was held at Madison, March 15, 1909. *H. L. Maxfield,* city attorney, appeared on behalf of the city of Janesville. For the Janesville Water Company *E. M. Hyzer* appeared.

Hearing on both complaints and the matter of the valuation of the property of the company was held in Madison, Sep. 21, 1910. Appearances were as follows: For the city of Janesville, *H. L. Maxfield,* city attorney. For the Janesville Water Company, *Jeffris, Mouat, Smith and Avery,* by *M. G. Jeffris.*

The first hearing dealt principally with the jurisdiction of the Commission. It was argued on behalf of the company that the franchise granted by the city of Janesville to the water company was a contract and not merely a permit. Counsel for the respondent pointed out that the franchise in question was granted in consequence of a special act of the legislature of Wisconsin, authorizing the mayor of Janesville to enter into a contract for securing a supply of water to the city. The Commission decided that it had jurisdiction with regard to the matter in dispute and ordered a valuation of the property to be made. At the first hearing a number of matters contained in the original complaint were also discussed, and it was shown that the respondent has changed its rules so as to remove some of the causes for complaint. Consumers are now permitted to buy meters where they will and install such meters, subject, of course, to the company's right of inspection. The company has also discontinued the practice of charging a meter rent in cases where meters are owned by the company. The company also denied that any water is pumped from Rock river. It was shown that sewerage is emptied into the Rock river above the plant of the respondent and that the water is unfit for use. No proof, however, was offered in support of the statement that no water is pumped from the river, so that this remains a matter for determination in connection with the case.

In the second hearing the question of valuation was brought up and discussed to some extent, as well as other matters relating to the charges contained in the complaints, but these will be taken up later in this decision in connection with the various portions of the complaint. In brief, then, the matters to be determined in this decision are six in number:

1. Whether or not services should be installed at the expense of the consumer.
2. Whether meters should be owned by the consumer or by the company.
3. Whether or not the water furnished by the company is taken from the Rock river.
4. Whether the extensions which have been ordered by the city should be made.
5. The reasonableness of the rates charged by the company.
6. The reasonableness of the rule that consumers whose water supply has been shut off for non-payment, or for failure to comply with the rules of the company, must pay in order to have water turned on again.

As the reasonableness of an order requiring the company to extend its mains, or to reimburse patrons who have installed services and meters, will depend very largely upon the revenues of the utility, it is necessary to determine what are reasonable rates to be charged by the company before an order relating to extensions or to the ownership of meters and services can be made.

RATES.

The complaint, as stated above, sets forth, among other things, that the Janesville Water Company charges unlawful rates for water. At present the company has in effect a schedule of flat rates and a schedule of meter rates.

Following are the meter rates:

Average		less	than	500	gallons	per	day	35	cts.	per	M	gallons
500	and	less	than	1,000	"	"	"	30	"	"	"	"
1,000	"	"	"	2,000	"	"	"	25	"	"	"	"
2,000	"	"	"	5,000	"	"	"	22½	"	"	"	"
5,000	"	"	"	8,000	"	"	"	20	"	"	"	"
8,000	"	"	"	10,000	"	"	"	15	"	"	"	"
10,000	"	"	"	13,000	"	"	"	12	"	"	"	"
13,000	"	"	"	15,000	"	"	"	10	"	"	"	"
15,000	"	"	"	20,000	"	"	"	8	"	"	"	"
20,000	"	"	"	25,000	"	"	"	7	"	"	"	"

No schedule rate has been filed for a use of from 25,000 to 150,000 gallons per day, but where the amount used averages more than 150,000 gallons per day the rate is 5 cts. per M gallons. The minimum charge for consumers on a meter basis is $2.50 per quarter.

The flat rates are as follows:

Dwellings of 5 rooms or less.

	One family.	More than one family each.
One faucet at sink or basin	$5.00	$4.00
Each additional room, add[1]	.75	.75
Each additional faucet[2]	1.00	1.00
One water closet	4.00	3.00
Each additional water closet	2.00	2.00
One bath tub	4.00	3.00
Each additional bath tub	2.00	2.00
One urinal	3.00	2.00
Each additional urinal	1.00	1.00
Boilers for steam heat	5.00	....

Other flat rates.

Hose for sprinkling ¼" nozzle, 2 hours per day	$8.00
Meat and fish markets	10.00
Barber shop, 1, 2, or 3 chairs	7.50
Each additional chair	2.50
Lime or cement, per barrel	.08
Stationary steam engines, working not over 10 hours per day, per horse power	3.00
Laying stone, per cord	.25
Laying brick, per thousand	.10
Laying cement side walk, per lineal foot	.01
Brick paving, 36 feet wide, per lineal foot	.03
Asphalt paving " " " "	.03
Macadam, tar paving " " " "	.03
Sewer work, for each foot in depth	.005
Cement curb and gutter	.01
Plastering, per 100 square yards	.25

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[1] No charge over ten rooms.

[2] Where a wash basin, sink or set tub has both a hot and cold water faucet, it will be called but one. Faucets used by only one family will be rated same as in houses occupied by only one family. When faucets are placed in each tenement, each tenement will be charged the same rates as dwellings occupied by but one family.

	Hotels, boarding houses and manufactories.	Stores, offices, etc.	Private stables.	Livery and boarding stables.	Barber shop. 1,2 or 3 chairs.
One faucet at sink or basin	$15 00	$7 00	....	....	$7 50
Each additional faucet....	3 50	1 50	....	....	1 50
One water closet..........	10 00	5 00	$4 00	$5 00	5 00
Each additional water closet..................	3 00	2 00	2 00	2 00	2 00
One bath tub...	10 00	5 00	4 00	5 00	5 00
Each additional bath tub.	3 00	2 00	2 00	2 00	2 00
One urinal................	5 00	3 00	3 00	5 00	3 00
Each additional urinal....	2 00	1 00	1 00	2 00	1 00
Boilers for steam heat.....	10 00	....	....	....	....
One hose..................	....	....	3 00	....	....
First ten horses...........	....	....	....	15 00	....
Each additional horse.....	....	....	2 00	2 00	....
One cow..................	....	....	2 00	2 00	....
Each additional cow.......	....	....	1 00	1 00	....
Each additional chair......	....	....	....	....	2 50

Saloons. 1 faucet..	$15 00

Other fixtures as stores and offices.

In addition to the rates shown above, sec. 12 of the rules and regulations of the utility reads as follows:

"When connection with the mains of this Company is made for the purpose of furnishing fire protection, a minimum charge will be made for water to be used on the premises other than for fire protection as follows:

2 inch openings...................................	$25 00	per year.
3 " "	35 00	" "
4 " "	75 00	" "
6 " "	125 00	" "

The hydrant rental is made up of a charge of $4,200 per year for 180 hydrants, and $25 each for additional hydrants.

Water is supplied in accordance with contracts as follows:

City drinking fountains, horse and man....................	$30 per year.
City park sprinkling—5 months..........................	150 " "
Cemetery association- 5 months.........................	250 " "
Street sprinkling carts............................	$20 and $25 per mo.

A valuation of the property of the company was made under date of Nov. 1, 1909. According to this valuation the cost new amounted to $245,999 and the value on the valuation date was $229,162. This valuation has been revised and brought down to Jan. 1, 1910. The following summary shows the value of each class of property entering into the revised valuation:

REVISED VALUATION OF PHYSICAL PROPERTY,
January 1, 1910.

Classification.	New.	Existing.
1. Land	$7,352	$7,352
2. Wells, intakes and suctions	12,096	11,771
3. Standpipe, reservoir, and filters	16,718	15,734
4. Distribution system	148,858	143,535
5. Pumping plant equipment	16,923	12,027
6. Bldgs. and misc. structures,	10,016	7,668
7. Office furniture and appliances	675	472
8. Tools	1,666	851
9. Miscellaneous	665	594
Total items 1—9	$214,969	$200,004
10. Add 12%*	25,796	24,000
11. Stores and supplies	2 919	2,919
12. Paving	2,642	2,575
Total	$246,326	$229,498

*Add 12% for engineering, superintendance, interest during construction, contingencies, etc.

In addition to the amounts included in the foregoing summary, the company owns land to the value of $100, which is listed as non-operating property and should not be included in the valuation, as it is not property used and useful in connection with the business of furnishing water.

The company's construction work appears not to have involved any expense for paving, so this item should be eliminated in making up the final valuation. The valuation as of Jan. 1, 1910, then amounts to a cost new of $243,684 and an existing value of $226,923.

On the part of the city no objection to the staff's valuation was made. The objections entered by the company related to the valuation placed upon land and pumps, and the exclusion of all services from the valuation. Further investigation by the staff has led to an increase of $300 in the valuation of the land, which increase is included in the summary of the revised valuation, shown above. The company introduced testimony to show that the present cost of reproduction of two pumps, which the staff have included in their valuation at $6,500 new, is considerably above that amount, but an investigation by the staff has shown that no increase in the value placed upon these pumps is necessary.

With regard to services, some confusion has arisen because the company first stated that it owned no services, and the engineer's valuation was made with this statement in mind. Since the date of the valuation the company has found that in building the original plant $5,833.60 was paid for services.

There is no record of the location of these services nor of the actual number installed. Since the original plant was constructed, services have been put in at the expense of the owner of the property to be supplied with water, and the company has not been able to determine, in many cases, whether a service has been paid for by the utility or by the property owner. There appears to be no question, however, that some of the services were installed at the expense of the company, as claimed.

Justice to the company requires that services which it has installed at its own expense should be included in the valuation for purposes of rate making. The same applies to meters which are owned by the utility. As meters and services in use in Janesville are owned very generally by consumers, it appears best to consider all services and meters separately from the revised valuation. This does not mean that meters and services are not to be considered as an element entering into the value of the property, but as they are elements which may be easily considered apart from the other property, it has seemed best to consider them entirely by themselves. The reasons for so handling them will appear more clearly later in this decision.

The summary given above includes the value new of meters, meter boxes, and unpaid meter accounts amounting to $1,209, and the value on Jan. 1, 1910, to $739. Of this, $442, both of cost new and existing value, is made up of meters which were sold to consumers but had not been paid for by consumers on the date of the valuation. As all meters are to be considered separately from other items whose value is shown in the above summary, it will be fair to deduct from the results shown in the summary the value of all meters. The cost new, with such deductions, is $242,475, and the existing value to Jan. 1, 1910, was $226,184. During the year ending June 30, 1910, the report of the company shows that $1,015.37 was expended for new construction. How much of this was incurred between Jan. 1 and June 30, the report does not show, but it is probably fair to add one-half of the extensions during the fiscal year to the physical value of Jan. 1, 1910, in making up a valuation of June 30, 1910. This means that the cost new on June 30, 1910, was within a very few dollars of $243,000, and the existing value was very nearly $226,700.

The figures given in the preceding paragraph as the value of the physical property do not agree very closely with the investment reported by the utility, which is given in the report for the end of the fiscal year 1909—1910, as $437,049.26, "as per construction account". An examination of the books of the utility, however, shows that the value of $437,049.26 does not represent investment, but includes bond and stock issues.

In fixing the final valuation for rate-making purposes, the value of meters and services must be included, but these can be valued separately and the interest and depreciation charged directly to consumers served. The Public Utilities Law expressly prohibits a utility from charging a consumer who owns his equipment, or any portion thereof, a lower rate than that paid by consumers who do not own such equipment, but provides that in case a consumer owns his equipment the utility may pay him a reasonable rental for its use. Some of the services and meters are owned by the utility in the present case, and some by consumers, but it is clearly the intent of the law that all should be charged alike for equivalent service. In the case of meters and services which the company owns, the revenue must be sufficient to pay interest and provide for depreciation of the meter and service in addition to paying a proper share of plant expenses. As no lower rate can be made to consumers who own their meters and services, the revenue from such consumers must also be sufficient to provide for interest and depreciation. Any injustice from this can be avoided by having the company pay a reasonable rental for the services and meters which are owned by consumers, which reasonable rental would be about equivalent to interest and depreciation upon investment made by consumers in supplying what might be regarded as a part of the utility.

The value of meters and services from the mains to the curb, as of May 1, 1911, is shown in the following summary:

	Cost new.	Present value.
Meters owned by company	$644	$530
Meters owned by consumers	10,588	8,721
Services to curb	22,458	19,538
Total	$33,690	$28,879

The physical valuation to be considered, then, amounts to $243,000 new, and $226,700 in present condition, exclusive of meters and services, which are properly a part of the plant, but which, owing to their divided ownership and the fact that interest and depreciation on these are in the nature of consumer charges which may be assessed directly against those using the service, have been valued separately from the rest of the investment throughout this decision.

These figures relating to the valuation cover physical value only, and do not include any allowance for the intangible elements entering into the valuation. Of these intangible elements there are two which the respondent maintains necessitate placing the value of the property at a higher figure than that arrived at by the staff. The first of these elements is that of discount on bonds, issued during the early years of the plant's operation, which discount was originally stated as $20,600. In order to understand the conditions surrounding the early bond issues, it will be necessary to review briefly the history of the organization of the utility. On May 10, 1887, the city of Janesville granted a franchise to Turner, Clarke & Rawson, a co-partnership, their successors and assigns, for the construction, maintenance and operation of a system of water works for fire protection and other public and private uses within the city. On July 16, 1887, the Janesville Water Company was incorporated under the laws of Wisconsin, and between the date of such incorporation and Aug. 1, 1887, it acquired the franchise and property of Turner, Clarke & Rawson. The plant was built by the Wisconsin Construction Company, which appears to have been organized by the original grantees, Turner, Clarke & Rawson. Bonds were issued to the Wisconsin Construction Company by the Janesville Water Company, as follows:

September 6, 1887	$112,000
February 1, 1888	28,000
December 1, 1888	20,000

All of the above were 6 per cent bonds. The first $140,000 of bonds were issued at 86 cts. on a dollar, the total discount amounting to $19,600. Records of the company failed to show that there had been any other discounts than the $19,600 shown above, although the officials expressed the belief that other discounts had occurred, bringing the total up to $20,600.

Five per cent bonds, without any discount, were issued as follows:

October 1, 1890	$4,000
September 1, 1895	11,000

According to the testimony of officials of the company, these latter bonds were issued at par to the stockholders of the Janesville Water Company, who had supplied money for new construction. During the year 1890 the rate on the 6 per cent bonds was reduced to 5 per cent, as a result of the poor financial condition of the plant.

The relation of bond discounts to plant valuation cannot be determined without a knowledge of the circumstances existing at the time of the bond issue. It has usually been considered that when a community is in need of a utility to supply a particular class of service and when money for the construction of the plant can be secured on no better terms, the discount on bonds constitutes a proper charge to capital. In the present case there may be some question as to whether money for construction purposes could not have been obtained on better terms. A few years later stockholders of the Janesville Water Company accepted 5 per cent bonds at par. In cases where a discount on bonds is necessitated by a low interest rate, the fact that a discount is made amounts to a postponement of a portion of the interest payment until the date of maturity of the bonds. In the case under consideration, however, the interest rate of 6 per cent appears to have been at least as high as the normal rate for such bonds. The fact that these bonds were soon afterward reduced to a 5 per cent interest basis, because the plant was unable to meet a 6 per cent rate, seems to indicate that some discount was necessary to secure capital for construction purposes. On the other hand, that the utility was in poor financial condition may have been due to the fact that the community was not greatly in need of the water plant at the time it was built, or to the fact that not enough allowance was made for working capital during the period in which the business was being built up. Some allowance, probably, will have to be made in fixing the value of the plant, for the discount on bonds, but it is questionable whether all of the $19,600 accounted for should be considered as a plant investment.

The second element of intangible value which the respondent maintains it should have added to the physical valuation, is that of going value or the cost of building up the business. The following table shows the number of consumers at the end of each year, the average daily pumpage by years, the expenses, and the earnings:

STATISTICS OF DEVELOPMENT.
JANESVILLE WATER CO.

Year.	No. of consumers end of year.	Average daily pumpage, gallons.	Expenses excl. int. and depreciation.	Earnings.
1887	92	....	....	....
1888	409	....	$2,000 00	$3,477 66
1889	513	....	4,362 99	9,769 56
1890	701	....	4,371 93	11,014 45
1891	857	362,000	4,000 00	14,024 64
1892	964	379,000	11,111 47	17,295 78
1893	1,072	475,000	4,695 28	19,227 72
1894	1,186	562,000	10,865 45	22,012 08
1895	1,310	749,000	13,276 57	24,144 99
1896	1,355	637,000	12,329 46	24,844 04
1897	1,407	622,000	12,966 34	24,393 16
1898	1,468	543,000	12,125 72	24,833 14
1899	1,525	798,000	14,128 03	26,061 52
1900	1,580	709,000	12,383 12	27,990 31
1901	1,671	797,000	14,341 10	29,366 20
1902	1,730	726,000	15,855 67	30,579 34
1903	1,797	771,000	17,103 17	31,317 24
1904	1,844	982,000	18,583 24	33,041 70
1905	1,931	982,000	18,747 37	34,592 16
1906	2,014	940,000	18,318 31	36,340 63
1907	2,079	892,000	20,345 62	37,512 25
1908	2,167	947,000	16,989 21	40,289 26
1909	2,258	974,000	21,936 77	41,189 27
1910	2,322	1,103,000	21,211 26	42,826 93

This table shows that the process of building up the business has been a very gradual one. With a few exceptions there has been a development from year to year, but there was no period of very rapid growth. The next table shows the amount available for return on investment for each year, the average investment, and the rate of return. Average investment has been computed on two bases, first, the amount actually invested in the property as shown by the records of the company, and second, the result obtained by subtracting from the cost new, as determined by the staff, the amount of money put into construction each year.

RATE OF RETURN
JANESVILLE WATER COMPANY.

Year.	Amount available for return on investment.	Average investment, from construction records.	Rate of return, per cent.	Average cost new, from engineer's valuation and construction records.	Rate of return, per cent.
1888	$1,477 66	$160,000	0.92	$171,890	0.86
1889	5.406 67	213,067	2.54	173,159	3.12
1890	6.642 52	214.640	3.10	173,182	3.83
1891	10.024 64	214,663	4 66	173.615	5.77
1892	6,184 31	215,095	2.87	177,630	3.48
1893	14,532 46	219,110	6.63	183,365	7.93
1894	11,146 63	224,845	4.96	191,199	5.82
1895	10.868 42	232,679	4.67	196.902	5.52
1896	12,514 58	238.506	5.25	197,026	6.35
1897	11,428 82	240,519	4.75	199.039	5.75
1898	12.707 42	243,971	5.21	202,492	6.29
1899	11,933 49	246,486	4.84	205,006	5.82
1900	15.607 19	248.448	6.28	206,969	7.54
1901	15,625 10	253,094	6.17	211,615	7.39
1902	14.723 67	257,881	5.71	216.403	6.80
1903	14,214 07	265,376	5.37	223,898	6.37
1904	14,458 46	272,089	5 30	230,610	6.26
1905	15,844 79	272,861	5.80	231,383	6.85
1906	18.022 32	274.431	6.56	232,949	7.73
1907	17,166 63	280,206	6.11	238,723	7.20
1908	23,350 05	285,337	8.17	243.855	9.57
1909	19,252 50	286,666	6.70	245,185	7.85
1910	21.585 73	*288,000	7.50	*246,500	8,73

* Approximate.

Since 1890 the company has earned a return on investment, in most cases, of from 5 to 8 per cent. The return for the entire period, on the first basis shown in the table, amounts to 5.4 per cent upon the investment and, on the second basis, the return is 6.45 per cent. Using a valuation based upon the cost of reproduction as determined by the staff, the rate of return since 1893 has been sufficiently large to constitute about a reasonable return. Up to 1893 the plant was in a position where its domestic and industrial business had not reached a sufficient degree of development to yield an adequate return. During this period at least, the losses incident to building up the business may be regarded as a part of the investment.

Attention should be called to the effect of excessive salaries upon the rate of return and consequently upon the apparent failure of the plant to reach a paying basis. The reports of the utility, for periods prior to the adoption of the uniform classification of accounts, did not separate salaries of general officers from other general expenses. For the past few years, however, it is clear that salaries have been so high as to appreciably affect the rate of return. If this same condition has prevailed throughout the life of the utility, the nominal rates of return, as shown in the foregoing table, are lower than the actual rates.

The amount which should be added to the physical value of the plant to provide for the discount on bonds and the going value of the concern, cannot be determined with absolute exactness. There may also be a question as to whether such increment should constitute an addition to the cost new of the property or to the value in its existing condition. If the cost new is the basis, it may be said, in general, that the going value estimate should take into consideration a rate of return which should provide only for return on property and not for depreciation, for if the cost new is used, allowance is thereby made in the valuation for such amount as should have been set aside to cover depreciation. On the other hand, if the present value is used, the rate of return which is considered in arriving at the going value must be a rate which will cover interest and profits, and also depreciation. In the present case it seems that the allowance for going value and for discount on bonds constitutes a considerable addition to the existing value, but not a large increase in the cost new. A valuation, exclusive of meters and services, of $250,000 appears to be a fair and reasonable valuation for purposes of this decision.

OPERATING EXPENSES.

The following statement shows the operating expenses of the Janesville Water Company for the fiscal years ending June 30, 1909, and June 30, 1910, as reported to the Commission:

OPERATING EXPENSES.

JANESVILLE WATER CO.

	1909	1910
STEAM POWER PUMPING		
Pump labor	$940 00	$960 00
Steam generated	4,872 39	5,493 84
Lubricants	84 26	73 40
Miscellaneous pump station supplies and expenses	206 05	161 93
Maintenance of pumping equipment	43 04	97 32
Maintenance of auxiliary equipment	67 95	42 77
Maintenance of pump station buildings etc	261 55	115 10
Total steam power pumping	$6,475 24	$6,944 36
DISTRIBUTION		
Street department labor	$740 00	$780 00
Meter and fittings department labor	173 52	....
Street department supplies and expenses	405 63	421 71
Meter and fittings department supplies and expenses	165 80	....
Maintenance of reservoirs, tanks etc	20 00	1 11
" " distributing mains	40 24	11 53
" " services	41 12	26 83
" " hydrants	101 64	110 13
" " meters	15 62	....
Total distribution	$1,703 57	$1,351 31
COMMERCIAL		
Reading meters and delivering bills	$29 75	$31 00
Collection supplies and expenses	71 60	....
Total commercial	$101 35	$31 00
GENERAL		
Salaries of general officers	$7,420 00	$7,539 95
Salaries of general office clerks	126 96	360 00
General office rent	600 00	600 00
Miscellaneous general office supplies and expenses	278 40	377 65
Law expenses—general	1,055 95	1,502 50
Maintenance of general office equipment	6 30	....
Total general	$9,487 61	$10,380 10
UNDISTRIBUTED		
Insurance	$106 50	....
Stationery and printing	31 70	$72 73
Total undistributed	$138 20	$72 73
Total of items	$17,905 97	$18,779 50

Most of the items of expense as shown in this statement appear to be reasonable and normal expenses, but there are a few items with regard to which an adjustment should be made. In general, the expenses for the year ending June 30, 1910, may be considered as the correct basis upon which to estimate the usual operating expenses, and they have been accepted for this purpose, with exceptions as noted below.

The report for 1910 contains no item of meter and fittings department labor, although this expense in the preceding year amounted to $173.52. Nearly all of the meters in use in Janesville are owned by the consumers, as are also the greater part of the services, but meter and fittings department labor is an item of expense which should be borne by the utility, regardless of the ownership of meters and services. No exact statement of this expense can be made, but such data as are available with regard to this expense in other utilities in the state indicate that the expense of meter and fittings department labor for the Janesville company will be about $150 per year with the present installation of meters.

Officials of the utility stated that such work in maintenance of meters as could be done at the company's repair shop, was done without cost to the consumer, but that when it was found necessary to ship a meter away for repairs, the consumer was obliged to pay the cost. As shown in the above table, the cost of maintenance of meters amounted to $15.62 in 1909, and nothing was reported under this head in 1910. Data submitted by the company shows that 823 meters were installed on May 1, 1911. There seems to be no question that the maintenance of meters is an expense which should be borne by the utility. *In re Investigation of the Hudson Municipal Water Works,* 3 W. R. C. R. 138, 146, this Commission said:

> "The logic is overwhelming to the effect that meters constitute a part of the facilities incident to the service for which the management, whether public or private, is responsible. A meter is a part of the equipment of the plant which, in the present case, the city of Hudson has constructed and is maintaining and operating. The city, and the city alone, is responsible for the type of meters used and their accuracy."

The same line of argument would seem to apply to the maintenance of meters. If the utility is responsible for the accuracy of the meters used, it is clear that the maintenance of those meters is a duty of the utility, and the expense of such maintenance is a proper charge to operating expenses. The cost of maintaining meters is an item which varies so greatly with local conditions that it is not practicable to fix in advance what the cost of such maintenance will be. It depends upon climatic conditions, upon where meters are set, upon the amount of sediment in the water, and upon other factors. In Janesville it has been the general policy of the company to require the installation of meters in residences of the better class, where they can be placed in cellars in such a position as to secure almost complete protection against severe cold. The expense of maintaining meters under such conditions appears to be from 10 to 20 cts. per year per meter. Any statement of the amount of this item of expense must be, in a sense, an estimate, but there seems to be no question that from $100 to $150 per year should be allowed for this purpose.

There are a number of small items of expense reported in 1909 which do not appear in the report for 1910. The total expenses for 1910, however, are considerably in excess of those of 1909. The expenses of pumping, distribution, and collection, as reported for 1910, appear to be adequate, with additions and changes as noted.

There are two items of "General expenses" which are open to question, and which need revision. The first to be considered is that of "Law expenses—general," which is reported as $1,055.95 for 1909 and $1,502.50, for 1910. Such expenses of the present case before the Railroad Commission as have already been paid, are included in the general legal expenses as reported, but as general legal matters and part of the proceedings before the Commission were handled by the same attorney, the officials of the company expressed their inability to apportion the reported legal expenses as between "Law expenses—general" and "Railroad Commission expenses." The officials also stated that legal expenses during the past two years have been abnormally high on account of the new bond issues, and the superintendent estimated that the usual cost of general legal business would not be over $100 per year. "Railroad Commission expenses" should not be charged to a single year, or even to two or three years in which they were actually incurred, but should be apportioned over a number of years, inasmuch as they are not expenses which will arise in the ordinary course of the business. In the light of the facts as presented above, it is clear that not all of the legal expenses reported during the last two years need be considered in determining an average and normal expense of operation. To determine what this amount should be, however, is more difficult and necessitates another estimate. The total legal expenses of the utility during 1907 were $550. With "Railroad Commission expenses" apportioned over a number of years, it seems that the amount properly allowable for "Law expenses—

general" and "Railroad Commission expenses" will not be in excess of $1000 per year.

The amount reported as expended for "Salaries of general officers" appears excessive, although the excess is not as great as first appears to be the case. Salaries of superintendent and assistant superintendent have not been apportioned among the departments, and consequently the reported salaries of general officers are very much in excess of the amount which should have been reported under this heading. According to the statement of the superintendent, the salaries at present paid by the company, which are being reported as "Salaries of general officers", are as follows:

Superintendent	$2,000	per year.
Assistant supt	900	" "
President	2,400	" "
Secretary	1,200	" "
Treasurer	1,200	" "
Total	$7,700	per year.

No very definite statement could be secured as to the services performed by the president, the secretary, and the treasurer. Practically all of the active work of management is in the hands of the superintendent, by whom it appears to be very efficiently carried on. It was admitted that the president and the secretary devoted very little time to the management of the plant, acting only occasionally in an advisory capacity. The treasurer devotes more of his time to the business of the utility than either of the other general officers, but stated that only a small part of his time was actually taken up by the duties of his position. It was argued by the company in support of the salaries paid at present, that the time of the president is worth $25 per day. Without attempting to determine at this time whether or not this value is correct, it should be pointed out that the value of their time to the general officers themselves may be entirely different from its value to the utility. The value of a man's services and time to himself would ordinarily be judged by what he could dispose of them for, but the value to the utility must be judged by the results obtained. Even accepting the estimate of $25 per day as the value of the time of the president and allowing another $25 as the value of the services of the treasurer and the secretary, it is seen that an average of ninety-six days per year would have to be devoted to the utility in order for the officials to earn $4,800 per year. For limited periods the service of these officials may be worth much more than $50 per day to the utility, but it is clear that ninety-six days per year is much more than the amount of time actually spent in the service of the company.

With an expenditure of $2,900 per year for superintendence in a city of the size of Janesville, it would seem that not a great deal of the time of the general officers should be taken up in the active management of the plant. The amount which the utility shall pay to its general officers is a matter of policy which does not concern the public, but consumers have a very vital interest in the total return which the utility secures upon its investment. If the controlling stock holders choose to dispose of earnings in the form of large salaries, the minority stock holders may have interests involved, but as long as the total return on investment is reasonable, it is of no concern to the consumer whether earnings are disposed of in the form of salaries or in the form of dividends. The sole interest of consumers in this matter is, to be assured that the total rate of return is reasonable. Just as far as salaries of general officers exceed a reasonable and just compensation for the time and services of such officers, these salaries should be regarded as a portion of the return on investment. This line of reasoning has been followed by the board of gas and electric commissioners of Massachusetts. We quote from the decision of this board in regard to the petition against the Leominster Gas Light Company, on page 14 of its 25th Annual Report.

> "In view of the intimate relation which the management and owners of this company sustain to each other, it may be claimed that the management, if it desires, may choose between profits and a high operating cost, and that only the stockholders are interested as to whether a certain amount of income is retained for dividends or expended for management. But even if the public be not interested in the apportionment of a given sum between dividend and management cost, yet they have clearly an interest when the combination of such costs is unreasonably large. While it is true that the earnings divided among the stockholders in recent years have been far below what is considered a fair return on capital, it must be remembered, that the fair return is not to be measured by the dividends declared, but by the amount to which the company is entitled under the circumstances."

In the case of *Ross et al. v. Burkhardt Milling and El. Power Co.* 5 W. R. C. R. 139, 152, this Commission said, in speaking of the general expenses of the respondent in that case:

> "With respect to the "General expenses" the excess is due to the fact that the salary of the president has been placed at not far from $1,000 above the amount that appears to be warranted by the conditions. These conclusions are based on a detailed examination of the local conditions in this case, as well as upon facts disclosed by the examination of the facts and conditions that surround other plants that are similarly situated. Fairness seems to demand that, for the purposes of this case, these excesses should be eliminated from the expenses."

As outlined in this quotation, the amount which should be considered a reasonable expense for salaries must be determined by an examination of local conditions and by comparison with other plants which are similarly situated. It was pointed out above that the Janesville Water Company is paying $2,900 per year to a superintendent and his assistant. The plant has a well established business and pays salaries for superintendence sufficient to secure men who are thoroughly competent. Most of the duties of the general officers appear to consist of acting in an advisory capacity. All the local conditions point to the conclusion that salaries at present paid to general officers are greatly in excess of a fair amount. Although it makes no difference to the consumer whether a reduction is made in salaries or whether the reduction be in the amount to be returned in the form of dividends, consumers have a right to demand that the combination of salaries and interest shall not be unreasonable.

Comparison with other plants in Wisconsin is made difficult by the fact that of the private plants operating in cities substantially comparable to Janesville, a number are under the same general management as the Janesville plant, and the excessive allowance for salaries appears to be very general. Due to the wide variation in salaries paid, it is not possible to fix a normal salary by comparative means, but all the facts point to the conclusion that salaries at present paid to the general officers of the Janesville Water Company are more than double what they should be. An allowance of $2,000 per year, instead of $4,800, appears to be sufficient. Whether or not an actual reduction of $2,800 per year should be made in salaries paid, makes no practical difference. The essential thing is, that the combination of salaries, which may be regarded as a form of return on investments, and dividends, should be reasonable.

With these changes in the operating expenses as reported for 1910, we have made up the following statement of expenses, which appears to be a correct and proper statement of operating expenses of the respondent under normal conditions:

STEAM POWER PUMPING:		
Pump labor	$ 960 00	
Steam generated	5,493 84	
Lubricants	73 40	
Misc. pumping station, supplies and expenses.	161 93	
Maintenance of pumping equipment	97 32	
Maintenance of auxiliary equipment	42 77	
Maintenance of pumping station, buildings, etc	115 10	
Total pumping		$6,944 36
DISTRIBUTION:		
Street department labor	$780 00	
Meter and fittings department labor	150 00	
Street department supplies and expenses	421 71	
Meter and fittings department supplies and exp.	80 00	
Maintenance of reservoirs, etc	1 11	
" " services	26 83	
" " mains	11 53	
" " hydrants	110 13	
" " meters	125 00	
Total distribution		1,706 31
COMMERCIAL:		
Reading meters and delivering bills	$31 00	
Collection supplies and expenses	35 00	
Total commercial		66 00
GENERAL:		
Salaries of general officers, including supt.	$4,739 95	
Salaries of general office clerks	360 00	
General office rent	600 00	
Misc. general office supplies and expenses	377 65	
Law expenses—general	1,000 00	
Total general		7,077 60
UNDISTRIBUTED:		
Insurance	$100 00	
Stationery and printing	50 00	
Total undistributed		150 00
Total of foregoing		$15,944 27

In making up this statement of expenses, $80 has been included for "Meter and fittings department supplies and expenses," for which no report was made for 1910; $35 was included for "Collection supplies and expenses," $100 for "Insurance" for which no report was made for 1910, and $50 for "Stationery and printing," or substantially the average of the past two years. Only such departures from actual reported expenses have been made as appeared necessary to overcome unusual or abnormal conditions, and it is believed that the result obtained, $15,944.27, represents very closely the actual expense of the company when operating under normal conditions. In addition to $15,944.27, the annual expense of operation, provision must be made for taxes, depreciation and interest. Taxes may be included at the amount actually paid during the last fiscal year, $3,279.87.

The composite life of the property of the Janesville Water Company, exclusive of services and meters which are to be separately considered, is 56.21 years. If the 4 per cent sinking fund method of providing for depreciation is followed throughout, an annual rate of 0.496 per cent of the value of depreciable property would be sufficient to provide an adequate fund. On a straight line basis the rate would be 1.77 per cent. The possible depreciation, that is, the cost new, less scrap value, of depreciable property amounts to very nearly $177,000, excluding meters and services. In practice it has been found best to make provision for depreciation at the rate of about 1 per cent. In this case it seems best to make allowance for depreciation at about $2,000 per year.

At 7 per cent upon a valuation of $250,000 the interest to be provided for amounts to $17,500 per year. The total expenses which the utility will have to meet will therefore be about as follows:

Expenses of operation	$15,944.27
Taxes	3,279.87
Depreciation	2,000.00
Interest	17,500.00
Total	$38,724.14

APPORTIONMENT OF EXPENSES.

In the apportionment of the expenses as between the two classes of service, fire and general, the general principles to be followed have been outlined in former decisions of the Commission.

Briefly stated they are as follows:

Taxes, depreciation and interest should be apportioned between fire and general service on the basis of the division of plant value as between the two branches of service.

Actual operating expenses should be divided between output and capacity expenses, as repeatedly explained in previous decisions. In theory a third class should be made, of expenses which vary as the number of consumers and may be directly apportioned to consumers. In the present case, however, consumer expenses form such a small part of the total that nothing would be gained by separating them from the other expenses. There are, of course, certain expenses, such as maintenance of hydrants, which are chargeable entirely to the fire service, and expenses such as maintenance of meters, collection expenses, etc., no part of which is due to the fire protection.

Output expenses are then apportioned between fire and general service on the basis of the amounts of water used by the two classes. Capacity expenses, or at least the greater part of them, are proportionate to the demands exerted by the fire and by the general service. There are some of the capacity expenses for which the demands may not be a strictly equitable basis of distribution as between the two classes of service. Among these expenses are street department labor, street department supplies and expenses, and maintenance of mains. These are not a large part of total expenses, however, and it seems best to distribute them on the demand basis rather than on some arbitrary basis which might be very far in error.

An apportionment of the expenses, as shown in the revised list given above, shows that 51.1 per cent of all expenses are capacity, and 48.9 per cent are output expenses. That is, of expenses other than taxes, interest, and depreciation, $7,785.96 are output expenses, and $8,158.31 are capacity expenses. Of the capacity expenses a part may be directly apportioned to different classes of service. Hydrant rental, amounting to $110.13, is apportioned directly to fire service; meter and fittings department labor and supplies and expenses are due entirely to general service, and very largely to metered service; maintenance of services is chargeable entirely to general service, as are also commercial expenses, and maintenance of meters is a charge against that part of the service which is on a meter basis. The result of this direct apportionment shows $110.13 chargeable directly to fire service; $271 to metered service, and $176.83 to general service, leaving $7,600.35 of capacity expenses to be apportioned between fire and general service.

In apportioning output and capacity expenses between the two classes of service, it is necessary to determine, as closely as possible, the output for each class of service and the demand which may be exercised by each class.

Assuming that the maximum demands of the two classes of service will coincide, the fire demand has been found to constitute 44 per cent and the general demand 56 per cent of the total. In practice it is not at all probable that the maximum demand of one service will be exerted at the same time as the greatest demand of the other. The maximum demand for fire protection will be made only in case of an exceptionally large fire, and at such times such parts of the general service as street sprinkling, sewer flushing, and lawn sprinkling will be nearly, if not entirely, discontinued, and probably the other general uses of water will be somewhat lessened. To be sure, the greater pressure necessitated in order to afford protection against fires will affect the flowage through other openings, so that the lessening of the general demand may not be as great as would at first seem to be the case.

An apportionment on the basis of the separate maximum demands, therefore, may result in somewhat less than its fair share of demand or capacity expenses being charged to the fire service. On the other hand, it is not practical to determine the ratio of demand exerted by each class of service during the time of the peak, and consequently any apportionment based on the combined peak is very likely to be in error. Although the apportionment based on the separate maximum demands may result in understating the amount properly to be charged to fire protection, this basis of apportionment appears to bring nearer the correct results than any other basis available.

Of the $7,600.35 of capacity expenses, common to the two classes of service, 44 per cent or $3,344.15 is to be charged to fire protection, and 56 per cent or $4,256.20 to general service.

The actual amount of water used for fires is usually very small by comparison with the total amount of water pumped, but a largely increased pumpage is needed to keep up fire pressure, even when no water is actually used for fire protection. The records of the company show that water was used for fire protection as follows:

In 1908	13 hours	30 minutes.
In 1909	11 "	45 "
In 1910	16 "	5 "

The station records also show that during 1908 there were 28 fire calls for which no water was used, 19 in 1909, and 20 in 1910. The ordinary pressure against which the pumps work is 73 lbs. and the fire pressure ranges from 110 to 120 lbs. With an average use of water for fire purposes of about 15 hours per year, the increased pumpage, due to increased pressure alone, would probably amount to about 1,000,000 gallons per year.

There are no records available as to the average number of fire streams actually in use. If we assume that during the time that pressure is kept up for fire purposes and average of three fire streams is in use, less than half a million gallons per year will actually be used for fire protection. Even taking into consideration the additional pumpage necessitated by keeping higher pressure on the main, it is not likely that much more than 1,000,000 gallons per year will actually be used for fire protection. The amount of output expense to be borne by the fire service is therefore so small as to have practically no effect upon the total charge. Of the output expenses of $7,785.96, about one-half of one per cent are chargeable to fire service, or not to exceed $40 per year. This amount may appear very low, but when it is remembered that it covers only the variable element of cost of furnishing the water actually used for fires, an amount of $40 per year seems ample to cover this particular item. The general service, then, should bear $7,745.96 of the output costs.

Interest, taxes and depreciation should evidently be apportioned on the basis of plant value, as they are directly proportional to value of property. The following summary shows the apportionment of investment as between fire service and all other service:

Classification.	Fire.		All other.		Total.	
	New.	Present value.	New.	Present value.	New.	Present value.
1. Land	$3,647	$3,647	$3,705	$3,705	$7,352	$7,352
2. Wells, intakes and suctions	6,986	6,797	5,110	4,974	12,096	11,771
3. Standpipe, reservoir and filters	4,646	4,450	12,072	11,284	16,718	15,734
4. Distribution system	85,717	83,245	63,141	60,290	148,852	143,535
5. Pumping plant equipment	7,624	5,410	9,299	6,617	16,923	12,027
6. Bldgs. and misc. struc.	4,407	3,374	5,609	4,294	10,016	7,668
7. Office furniture and appliances	....	....	675	472	675	472
8. Tools	855	446	811	405	1,666	851
9. Miscellaneous	326	290	339	304	665	594
Total items 1-9	$114,208	$107,659	$100,761	$92,345	$214,969	$200,004
10. Add 12%*	13,705	12,919	12,091	11,081	25,796	24,000
Total items 1 10	$127,913	$120,578	$112,852	$103,426	$240,765	$224,004
11 Stores and supplies	1,605	1,605	1,314	1,314	2,919	2,919
Total	$129,518	$122,183	$114,166	$104,740	$243,684	$226,923

* Addition of 12% to cover cost of engineering, superintendence, interest during construction, contingencies, etc.

This summary includes meters, listed at $1,209 new, and $739 in existing condition, in the statement of investment in distribution system apportioned to general service. With these amounts deducted, for reasons as given in the earlier pages of this decision, the cost new of property apportioned to general service is $112,957, and of total property $242,475. In existing condition the property apportioned to general service would be valued at $104,001, and total property at $226,184. With this revision of the apportionment 53.5 per cent of the cost new of the property and 54 per cent of its existing value are due to the fire service. As the present value was the base used in computing the intangible value of the plant, the apportionment of interest, depreciation and taxes may best be made upon the basis of 54 per cent to fire service and 46 per cent to general service. Interest on the intangible element of the property is apportioned on the same basis, although there may be an argument in favor of a different basis. From what has been said about the expenses of the utility, it is clear that the amount derived from hydrant rentals has been far below what should have been derived from this source, and a large part of the going value may be attributed to losses in this part of the business. It is questionable, however, whether intangible value can be considered apart from the physical value of the property, and for this reason all interest has been apportioned on the basis of the foregoing apportionment.

Taxes, interest and depreciation, as computed above, amount to $22,779.87. According to the basis of apportionment outlined above, $12,301.13 is due to the fire protection system, and $10,478.74 to the general service.

According to the foregoing apportionments, the expenses of supplying the two classes of service are as follows:

Classification.	Fire.	General.
Output	$40.00	$7,745.96
Capacity	3,344.15	4,256.20
Direct metered	....	271.00
Direct fire	110.13	....
Direct general	....	176.83
Taxes, interest and depreciation	12,301.13	10,478.74
Total	$15,795.41	$22,928.73

FIRE PROTECTION.

For the year ending June 30, 1910, the earnings from municipal hydrant rentals amounted to $7,298.00, or less than one-half of the cost of supplying fire protection. At the end of that year there were 305 hydrants installed. With an installation of 305 hydrants and a cost of fire service amounting to $15,795.41, the rate per hydrant will be $51.78.

In its decision, *In re Application of the Oconto City Water Supply, Company for Valuation of its Property and Other Relief,* 7 W. R. C. W. 497, the Commission took the stand that there should be no charge for private fire hydrants, except such as is included in the general charge to the city for fire protection. It does not seem necessary to repeat the reasons for that stand at this time.

The apportionment of expenses as between fire and general service, which is given earlier in this decision, includes under the head of fire protection only such protection as is furnished through hydrants. Consequently the amount arrived at as due to fire service, $15,795.41, is the cost of hydrant fire service only, but includes the cost of all such service, whether rendered through hydrants owned by the utility or through those owned by private parties.

There may be objection to charging all of the cost of hydrant fire service to the city, on the ground that the parties receiving fire protection through privately owned hydrants are not paying enough to the city in return for the protection, but if this is the case, we believe that it is a matter which should be settled between the city and the private parties. There seems to be no question that the city should pay for all such fire protection, and the relations between the private parties and the city do not affect the justice of such a method of charging.

GENERAL SERVICE.

As shown in the foregoing apportionment, $22,928.73 of a year's expenses are due to the general service, that is, to all service other than fire protection furnished through hydrants. The revenue from all service, other than municipal fire protection, for the years ending June 30, 1909, and June 30, 1910, was as follows:

	1909	1910
Earnings from commercial sales	$25,383.39	$25,276.92
" " industrial "	5,732.15	8,477.93
" " sales for street sprinkling	531.00	578.05
" " " to municipal depts	300.00	300.00
Misc. earnings from operation	375.02	848.81
	$32,321.56	$35,481.71

For the calendar year 1910 the earnings from commercial and industrial sales, and municipal departments amounted to $34,131.94, as reported by the company. No separate report was made for this period covering earnings from sales for street sprinkling or miscellaneous earnings from operation. If earnings from these sources are taken as the average of such earnings for the two fiscal years shown above, the total revenue will be $35,298.38. This is slightly less than the revenues from general sales during the fiscal year 1909—1910, due principally to the large amount of miscellaneous earnings during that year, consisting of earnings from sales to contractors, and for sewer work, steam rollers, etc. This amount, $35,298.38, includes $150 of earnings from private hydrants, which, as stated above, should be charged entirely to the city, thus leaving $35,148.38 as very nearly the amount to be derived from the general service in a year under the present schedule of rates. As stated above, the cost of such service is about $22,928.73 per year, thus leaving $12,219.65 as the amount by which earnings from general services may be reduced and still leave a reasonable return upon the value of the property.

A reduction equal to this amount, however, leaves out of consideration the value of meters and services, on which interest and depreciation must be provided for. Of course, the water company is not entitled to earn interest and depreciation upon equipment which is owned by consumers, but according to the provisions of the Public Utilities Law, the company is obliged, where part is its own property, to charge all consumers the same rate, regardless of the ownership of the equipment, and is allowed, in return, to pay a reasonable rental to consumers who own the equipment. The cost new of all meters and services upon the system of the respondent was found to be $33,690, and their present value $28,789. Of these amounts the value of services constitutes, respectively, $22,458 and $19,538, and the value of meters is $11,232 new, and $9,251 in existing condition. For practical purposes, it seems best to compute the rates without any reference to the value of meters and services and to add to the rates, as so determined, an amount sufficient to provide for interest and depreciation upon these portions of the equipment. The testimony shows that the value of services actually put in by the utility was $5,833.60. The most logical method of dealing with this question of services would be to provide that the utility should earn a return on all services, regardless of ownership, and pay the owners a reasonable rental in cases where services have been put in by consumers. In this case, however, there seems to be no record to show what services have been put in by consumers and what by the company, so that the best means of dealing with interest and depreciation on services seems to be to divide these items equally among all services. It would be logical to charge more to larger services if the ownership of all could be determined, but, as matters stand, the equal division of these expenses among all services seems to be the most feasible way of handling them.

On this basis, then, a reduction of approximately $12,200 per year can be made in the amount of revenue derived from the general service. Whether this reduction should be a general one, or whether there are certain classes of consumers within this general group which are entitled to a greater reduction than other classes, must be determined by an analysis of the use of water by the various classes.

The report for the year ending June 30, 1910, shows that the total pumpage for that year was 386,207,025 gallons. The total pumpage during the calendar year 1910 amounted to 402,895,808 gallons. In arriving at the reported pumpage, the utility has made no allowance for slip, but insisted that the slip was inconsiderable, as pumps were kept in good condition. The amount of slip necessary for the most economical and efficient operation of a pump is variously estimated by engineers at from 5 to 10 per cent of the total recorded pumpage. In estimating the amount of water lost by leakage and the amount of slippage, it is not expected that the results obtained will be accurate within a few million gallons, but as there is no way of determining the actual leakage in the distribution system, where sales are not made entirely on a meter basis, it becomes necessary to estimate this amount.

Leakage may vary from a very small part of the total amount of water delivered to the mains up to 50 per cent or more of the total, depending, of course, upon the condition of the distribution system, the amount of water used, and the pressure maintained. In this case the distribution system appears to be in good condition; the use of water is about normal, but the pressure maintained is slightly above the usual pressure maintained in similar systems. Under the conditions existing in Janesville it seems that an allowance for leakage, amounting to 5,000 gallons per mile of main per day, is reasonable. Upon this basis of estimate 100,000,000 gallons per year appears a reasonable allowance for slip, leakage, and for flushing mains, so that the amount of water actually delivered to consumers of all classes appears to have been about 300,000,000 gallons during the calendar year 1910. During the year ending June 30, 1910, 117,222,225 gallons, or a little over one-third of all water used, was sold through meters. During the calendar year 1910 the amount sold through meters was 127,442,636 gallons. According to these statements of water used, about 172,557,364 gallons were used for all purposes except the sales to consumers on a meter basis.

According to the apportionment of expenses given in the preceding pages, the output expense due to general service is $7,745.96 and a part of the taxes, interest and depreciation. These three items, chargeable to general service, amount to $10,478.74. In apportioning this amount as between output and capacity, the basis of total direct expenses is used, or 51.1 per cent to capacity and 48.9 per cent to output, which is equivalent to $5,354.64 of capacity and $5,124.10 of output expenses. The total output expenses of general service, then, are $7,745.96 plus $5,124.10, or $12,870.06.

If 300,000,000 gallons of water per year are actually delivered to consumers, no matter for what use or to what class of consumers, the output cost per 1,000 gallons is 4.29 cts. If the amount actually delivered to consumers is as low as 200,000,000 gallons per year, the output cost is 6.435 cts. per 1,000 gallons. Although an output cost of 4.29 cts. per 1,000 gallons is comparatively low, it seems that the amount of water delivered to consumers under the present method of selling cannot be far from 300,000,000 gallons per year. Over 127,000,000 gallons were sold to metered consumers, of which, however, nearly half was sold to a single consumer. The consumer data submitted by the utility shows that during 1910 revenue was derived from 804 metered consumers and from 1,635 consumers who were on a flat rate basis. Of the metered consumers, 803 used about 65,000,000 gallons of water. If the same average amount per consumer were used by flat rate patrons, the amount used by the 1,635 patrons on flat rates will be about 131,000,000 gallons per year. It has been the policy of the Janesville Water Company to meter the water sold to residences with lawn service, and to some of its other patrons who appeared to use excessive amounts of water under the flat rate plan. This would make it seem that the average use by 803 metered consumers is not a fair basis upon which to estimate the amount of water used by flat rate consumers. On the other hand, it should be remembered that the effect of the use of meters is to cut down the consumption by patrons on a meter basis to a very marked extent. The following statement showing the effect of meters is made up from the 1910 reports of Wisconsin water utilities, and includes all plants having more than two hundred commercial service connections, except in cases where the statistics reported were so very unusual as to be evidently incorrect:

Number of plants.	Per cent of com. serv. connections metered.	Daily pumpage per com. serv. conn.
19	0-10	818 gals.
29	0-25	734 "
18	25-75	564 "
16	75-100	477 "
13	90-100	470 "
8	100	474 "

There is no reason to believe that the introduction of meters in Janesville has not cut down the amount of water used by those consumers who have been placed on a meter basis, nor that consumers on a flat rate are different from such consumers in other cities where it has been found to be true, almost without exception, that the flat rate method of charging for water leads to waste and excessive use. If we assume that 131,000,000 gallons are used per year by revenue consumers on a flat rate, the daily use per commercial service connection is only 220 gallons. This estimate of 131,000,000 gallons per year does not include the amount used for sewer flushing, street sprinkling, construction purposes, schools, public buildings, etc. When these are taken into consideration, the estimate of 300,000,000 gallons as the total amount of water taken from the mains, or 172,557,364 gallons as the total amount used by all consumers other than those on a meter basis, appears to be a reasonable estimate.

In establishing a meter rate in a case where a relatively small part of services are metered, it becomes necessary to fix a rate which will yield a reasonable revenue, taking into consideration the fact that the use of meters decreases consumption. A meter rate appears to be just if it is a rate which would be satisfactory with all services metered. The output cost to be met by the new meter rate, then, must not be the cost per 1,000 gallons of supplying the amount of water now used, but the cost per 1,000 gallons of supplying what would be used if all services were metered. The amount of water which would be delivered if all services were metered cannot be accurately stated, but an estimate can be made which seems to be reasonably accurate.

As shown later in this decision, the amount estimated to be for public purposes and for sales to contractors is 39,550,000 gallons. If all of this were metered and paid for at regular meter rates, it is possible that the amount would be as low as 30,000,000. With 127,000,000 gallons sold through meters at present, this would account for 157,000,000 gallons. The total amount used, if all services and uses were metered, would probably be about 250,000,000 gallons per year. Assuming that the expenses of the utility remain the same as at present, the output cost per 1,000 gallons used would be 5.15 cts. With diminished use of water, such as would follow complete metering, the total output cost would be somewhat lessened, particularly the cost of steam generation. The total decrease, however, would probably not bring the cost per 1,000 gallons below 5 cts., and if the amount actually delivered should fall below 250,000,000 gallons per year, a rate of 5 cts. per 1,000 gallons, in addition to consumer and capacity expenses, would hardly return sufficient revenue. Considering all these conditions, it seems best to base our computations of revenue upon an average output cost of about 5.25 cts. per 1,000 gallons.

The capacity expenses of general service are made up of $4,256.20 of direct expenses of operation, $176.83 of which is apportioned directly to the general service, and $5,354.64 of interest, depreciation and taxes, making a total of $9,787.67. Besides this amount there is an expense of $271 which is apportionable directly to metered consumers.

The apportionment of capacity expenses among the various consumers should be made, in general, upon the basis of the demand which each consumer can exercise. The principal factors influencing demand are the distance and elevation with reference to the pumping station, the size of mains, the size, condition, and length of service pipes, and the number of taps. If all consumers were in a position such that they could make a demand equal to the full carrying capacity of their service pipes, and if the pressure under which water was delivered from the mains to the services were equal in all cases, the demands of the various consumers would be proportional to the carrying capacity of their services. If the pressure under which water is delivered from main to service could be kept uniform, a pressure assumed to be 45 lbs., and if services have a uniform length of 50 feet, the following table shows the amount of water flowing under perfect conditions, and the ratio of the amount flowing through each larger size of pipe, to the amount flowing through a ½ inch service.

Size of service.	Gallons per minute.	Ratio to ½"
½"........................	8.8	1
⅝"........................	15.4	1.75
¾"........................	24.3	2.75
1 "........................	50	5.7
1¼"........................	87.3	10
½"........................	137.7	15.5
"........................	282.7	31
2½"........................	493	56
"........................	780.2	88
"........................	1,602	183
"........................	2,791	320
"........................	4,470	510

In the practical operation of a water utility, however, the demands will be found to vary a great deal from the results shown above, especially in the case of large service pipes, as it is impossible to keep the pressure in an ordinary main up to the uniform pressure on the system in case a large service pipe is opened. The condition of mains and services will also affect the actual demand to a great extent. In order to determine what is the fixed expense per meter for various sizes, it seems best to assume that all consumers are being supplied through meter.

Residences are usually supplied through ⅝" meters, even when the service pipe is ¾" in diameter. Assuming that all consumers are supplied through meters, the number of meters of each size will be about as follows:

Size	Number	Size	Number
½ in. meter	232	2 in. meters..............	4
⅝ in. "	1,944	3 in. "	2
¾ in. "	212	4 in. "	2
1 in. "	38	6 in. "	1
1¼ in. "	3		

In view of the great defects in any table of theoretical demands when applied to practical working conditions, such tables do not aid very materially in determining how capacity expenses should be apportioned. It seems, however, that an apportionment as shown below will be just to all parties:

Size	Capacity charge per year.	Size	Capacity charge per year.
½ in. meter	$3.00	2 in. meter........	15.00
⅝ in. "	4.00	3 in. "	30.00
¾ in. "	4.50	4 in. "	50.00
1 in. "	5.00	6 in. "	125.00
1¼in. "	10.00		

Of the $271 of expense incurred directly by metered consumers, $31, the reported cost of reading meters, is to be apportioned equally among the meters in use. The remaining $240 is to be apportioned among the various meters according to the value of the meters. There are a number of kinds of meters in use in Janesville, but in arriving at the factor for use in this case, it has seemed proper to consider the style of meter in most common use. The following table gives the results of this apportionment:

Size of meter.	Value of meter.	•Factor.	Number of meters.	Factor times No. of meters.	Unit charge ⅝ in. meter.	Unit charge times factor.
⅝ in........	$12 40	1	759	759.00	$0.268	$0.268
¾ in........	21 60	1.74	24	41.76	.268	.466
1 in........	30 80	2.48	12	29.76	.268	.665
1½ in.......	50 00	4.02	2	8.04	.268	1.078
2 in........	65 00	5.24	4	20.96	.268	1.404
3 in........	135 00	10.88	2	21.76	.268	2.916
4 in........	160 00	12.90	1	12.90	.268	3.457
			804	894.18		

The above table shows the portion of the $240 of meter expenses which should be borne by meters of each of the sizes already in use in Janesville. Before a rate can be made for metered consumers, however, it is necessary to take account of the meter reading expense, interest and depreciation on meters and services, and that portion of the $176.83, expenses which are directly due to the general service, which should be borne by metered consumers.

The meter reading cost of $31 is a consumer expense which should be divided equally among all metered consumers. The $176.83 which was apportioned directly to general service is also a consumer expense to be apportioned directly among all residence, commercial and industrial consumers. Of this amount 33 per cent, or $58.35, should be divided equally among metered consumers. This, added to the meter reading expense of $31, makes a total of $89.35 to be divided in this manner, or 11.1 cts. per meter per year.

Interest and depreciation will amount to about 12 per cent of the value of meters. In apportioning this item of expense, the factors used in the foregoing table furnish the basis to be used. An allowance of 8 per cent for interest and depreciation for that part of the services which were put in by the utility must also be made, inasmuch as these have not been included in the valuation of the property which has so far been considered. This amounts to $466.69, or 19.1 cts. per service, apportioning this item of expense equally among all services.

The total fixed annual charge for various sizes of meters is shown in the following summary:

Size of meter.	Capacity charge.	Reading meter and direct general.	Meter expenses.	Interest and dep. on meter.	Interest and dep. on service.	Total.
⅝ in.	$4.00	$0.111	$0.268	$1.49	$0.191	$6.06
¾ "	4.50	.111	.466	2.59	.191	7.86
1 "	5.00	.111	.665	3.70	.191	9.67
1½ "	10.00	.111	1.078	6.00	.191	17.38
2 "	15.00	.111	1.404	7.80	.191	24.51
3 "	30.00	.111	2.916	16.20	.191	49.42
4 "	50.00	.111	3.457	19.20	.191	72.96

As stated before, interest and depreciation on services might more logically be apportioned according to the size of service, but such an apportionment is not practical at this time.

The column headed "Total" in the foregoing table represents the amounts of the annual service charge for the various sizes of meters. The following summary shows the total as given for each size of meter, and the quarterly service charge which should be made:

Size of meter.	Total annual "readiness to serve" cost.	Quarterly service charge.
⅝ inch	$6 06	$1 50
¾ inch	7 86	2 00
1 inch	9 67	2 50
1½ inch	17 38	4 50
2 inch	24 51	6 00
3 inch	49 42	12 50
4 inch	72 96	18 00

The amount of revenue per year which will be produced by the application of this service charge is shown in the next table:

Size of meter.	Number of meters.	Annual service charge per meter.	Total annual revenue.
⅝ inch	759	$6 00	$4,554 00
¾ inch	24	8 00	192 00
1 inch	12	10 00	120 00
1½ inch	2	18 00	36 00
2 inch	4	24 00	96 00
3 inch	2	50 00	100 00
4 inch	1	72 00	72 00
Total	804	....	$5,170 00

With annual metered sales equal to those of the calendar year 1910, or 127,442,636 gallons, the revenue which would be derived from the application of an average rate of 5.25 cts. per 1,000 gallons would be $6,690.74. If the rate for water is broken so that the first 50,000 gallons, for example, used per quarter are paid for at the primary rate, the next increment at a lower rate, and the excess at a still lower rate, the total revenue derived will probably be somewhat less than the amount stated. However, if all the water which would be delivered if meters were installed on all services were to be paid for at meter rates, a properly adjusted schedule would pay all the costs of the service. Of the 127,442,636 gallons which were sold through meters during 1910, only 39,311,910 gallons would have been paid for at the rate for the first 50,000 gallons used per quarter, and 6,987,549 gallons would pay the secondary rate. All of the rest, 81,143,186 gallons in all, would pay the excess rate. If all services were metered, however, the situation would be somewhat changed. With practically no exceptions, the residences would pay for water used at the primary rate. Schools and certain other users would pay for some of the water used at the secondary or even at the excess rate. Although no accurate statement of the amount of water to be paid for at each rate can be made, the figures seem to warrant the conclusion that about 100,000,000 gallons would be paid for at the primary rate, probably 50,000,000 at the secondary, and 100,000,000 at the excess rate, including in these estimates all water used, whether by private consumers or by the public, except such as is used for fire protection.

As stated before, if 250,000,000 gallons per year would be used on a complete meter basis, the output cost would amount to 5.15 cts. per 1,000 gallons, but as the water used might fall somewhat below 250,000,000 gallons per year, it appears best to compute meter rates on the basis of an output cost of about 5.25 cts. per 1,000 gallons.

If the unit charges for water are fixed at 7½ cts. per 1,000 gallons for the first 50,000 gallons used per quarter, 5½ cts. per 1,000 gallons for the next 50,000, and 4 cts. per 1,000 for the excess, according to the foregoing estimates of the distribution of water among the primary, secondary and excess classes, the revenue would be $14,250. As the output costs of general service were found to be $12,870.06, it is evident that unit prices as outlined above are sufficiently high to make allowance for consumption falling somewhat lower than 250,000,000 gallons per year.

According to this schedule, the revenue derived from the application of the unit prices to present metered sales would be as follows:

39,311,910 gallons at 7½ cts. per 1,000	$2,948 39
6,987,549 " " 5½ " " "	384 87
81,143,186 " " 4 " " "	3,245 73
Total	$6,578 99
Revenue from service charge	5,170 00
Total revenue from present metered users	$11,748 99

The average rate for water for users at present on a meter basis is thus somewhat less than 5.25 cts. per 1,000 gallons, due to an unusually large part being paid for at the excess rate. As shown above, the probable revenue from the unit prices, if all sales were metered, would be over $14,000, which is enough above the actual cost to make allowance for pumpage falling below the estimate used. A reduction of about $10,000 per year in the revenues from metered consumers, out of a total reduction in revenues from general service of about $12,000, which would be made if no consideration were given to the value of meters and services, may appear disproportionately large, but this reduction is clearly justified by an analysis of the cost of this class of service. A considerable portion of the reduction, of course, is made possible by the fact that the city is required to pay its proper share of the total expenses of the utility for fire protection. Aside from this reduction, however, an examination of the schedule of meter rates which the utility has had in effect during recent years, shows clearly that those rates were not made in accordance with the cost of service principle. The most evident defect of the old schedule is its regressive feature. Instead of charging all consumers alike for the first 500 gallons used per day, for example, the company has charged a consumer who used 400 gallons per day 35 cts. per 1,000 gallons, but a consumer whose use amounted to 600 gallons per day was charged 30 cts. per 1,000 gallons for the entire amount, instead of 35 cts. per 1,000 for the first 500 gallons per day. The result of this has been to enable a consumer to use a larger amount of water at a total cost less than the cost of a smaller amount.

A concrete illustration of this is the following: When the use of water was 728,000 gallons per quarter, assuming ninety-one days to a quarter, the total charge was $145.60. Then, owing to the regressive nature of the schedule, the total charge fell below $145.60 for larger amounts used and did not again reach this point until 1,820,000 gallons per quarter was used. That is, the quarterly charge for the two amounts was identical, although the amount used in one case was about 2½ times as great as in the other.

Furthermore, the schedule failed to take into consideration the different demands which could be made by consumers with meters of different size. If, under the old rate, the company could afford to sell 1,820,000 gallons for $145.60, it seems clear that a charge of this amount was too high for a consumer with the same demand who used only 728,000 per quarter.

It will be noted that the reduction for residences is in most cases from 20 to 40 per cent. The proportionate reduction for consumers who use from 200,000 to 800,000 gallons per year is much greater than this, which means that the old rate for uses of this amount was very much above the cost curve. The reduction for extremely large consumers is relatively small, because the low rate for large consumers, under the old schedule, brought the charge nearly down to the cost basis.

About three-fourths of the meters in Janesville are in residences, and the average use of water per quarter during 1910 is shown in the following summary:

	1st quarter	2nd quarter	3rd quarter.	4th quarter.
Residences	6,853 gallons	8,424 gallons	13,876 gallons	6,915 gallons
Flats	6,970 "	6,034 "	8,780 "	6,447 "

The reduction for these consumers will be from 20 to 30 per cent in most cases. The greatest reduction will be in the amount charged consumers who use from 3,000 to 10,000 gallons per day and who were charged, according to the old schedule, very much more than the cost of service, and more than their proportionate share of the total charge to metered consumers.

FLAT RATES.

In order to arrive at a system of flat rates which may be just to both the utility and the public, it is necessary to estimate as nearly as possible the amount of water which is used by the various classes of consumers other than those who pay for water on a meter basis. In making this estimate, the first step is to determine how much water is being used for various purposes from which the utility derives no revenue.

These are as follows:

1. Sewer flushing.
2. Schools and public buildings.
3. Churches.
4. Public fountains.

Sewer Flushing. To obtain an accurate statement of the amount of water used for sewer flushing is a practical impossibility. Estimates of the amount used vary so widely that we feel that very little reliance can be placed upon any of them. It is probable, however, that an estimate of 5,000,000 gallons per year as the amount used for this purpose is not much in error.

Public Buildings and Schools. The water used by schools and public buildings may be estimated with a fair degree of accuracy. It has usually been found that the amount of water used in schools is from 10 to 15 gallons per pupil per school day. The results of putting a meter upon the service pipe leading to the high school building for a period of one week, shows an average daily use of 6,170 gallons, or very nearly 15 gallons per pupil.

It is probable that the amount of water per pupil per day in the other schools is not as great as that used in the high school, as the buildings are not as well equipped with fixtures for the use of water. We estimate the amount of water used by public schools at 5,200,000 gallons per year. The amount used by other public buildings seems to be about 250,000 gallons per year.

Churches. The total amount of water used by churches is not large. Judging from the amounts used in cases where churches have been supplied upon a meter basis, the total amount of water used per year is not much more than 100,000 gallons.

Public Fountains. There are twelve public fountains, from only five of which the company derives any revenue. Two of these are display fountains, two are drinking fountains for horses only, and eight are drinking fountains for man, horse, and dog. A meter connected to one drinking fountain for one week, showed an average daily use of 6,025 gallons. These fountains have a continuous flow during the season. The total annual use of water appears to be about 12,000,000 gallons.

Street Sprinkling. The utility is paid for water furnished for street sprinkling at the rates of $20 and $25 per sprinkling wagon per month. With allowance for waste in filling wagons, the amount of water used for street sprinkling will probably be about 15,000,000 gallons per year.

Used by Contractors, etc. This amount is difficult to estimate, but it appears to be about 1,500,000 or 2,000,000 gallons.

A summary of the foregoing estimates shows the following:

Used for	Annual amt. in gals.
Sewer flushing	5,000,000
Public buildings and schools	5,450,000
Churches	100,000
Public fountains	12,000,000
Street sprinkling	15,000,000
Sales to contractors, etc	2,000,000
Total of above	39,550,000

Deducting 39,550,000 gallons from 172,557,364, the estimated total of water delivered for all uses other than through meters, we find that very nearly 133,000,000 gallons were delivered to flat rate consumers other than those included in the foregoing estimate during 1910, which is almost the same as the amount arrived at by assuming an average use equal to the average use by all metered consumers, excluding one extremely large user.

When the charge is made upon a flat rate basis, the very fact that the amount to be paid depends upon the fixtures and not upon the amount of water used, makes it extremely difficult to fix rates which shall correspond to the cost of service and make each consumer pay his proper share of the expenses of the utility. The total revenue to be derived from flat rate consumers, who were not included in the above special classes, should be sufficient to pay the proper share of capacity expenses and the output cost of from 131,000,000 to 133,000,000 gallons per year, or, possibly, as high as 140,000,000 gallons, based upon the amount of water used at present.

In making a schedule of rates, it is not practicable to distinguish between users of the same class who have service connections of different sizes, as, for example, between two residences of six rooms each, each with a single faucet, but one of which has a larger service pipe than the other. This does not mean that capacity expenses should not be apportioned among the individual consumers on the basis of their demands, just as much as this should be done in the case of consumers on a meter basis, but to distinguish between consumers of the same class would merely add one more element of complication to an already involved and unsatisfactory schedule. In general, consumers of the same class have services of uniform size, which eliminates any injustice which might be involved in neglecting the size of service as an element affecting the rate schedule, although there are many exceptions to this rule. Where injustice cannot be prevented under a flat rate plan, the obvious remedy is to use meters.

Of 1,635 flat rate consumers, excluding schools, churches, fountains, etc., 232 have ½ inch services; 94 have ⅝ inch; 1,279 have ¾ inch; 26 have 1 inch; and there are respectively 2, 1, and 1, of 2 inch, 4 inch, and 6 inch services. The total of capacity expenses which should be borne by all consumers, except those at present on a meter basis, is $7,162.50, based upon the units outlined for services of various sizes, and interest and depreciation on services amounting to $312.29, or a total of $7,474.70, exclusive of output expenses. The 1,635 consumers to be considered here should also pay the output cost of about 133,000,000 gallons of water per year, which would amount to $5,700 per year with present pumpage and operating expenses.

Before proceeding to make an adjustment of the schedule of flat rates, it may be well to consider what disposition should be made of the cost of water used for sewer flushing and street sprinkling, by schools and public buildings, by churches, and by public fountains. That the utility should be paid for water used for the foregoing purposes, does not seem to be open to question. That such payment should be made by the parties to whom the service is rendered, seems equally conclusive. What the payments should be, is not difficult to determine.

A proper payment for water used for sewer flushing and for street sprinkling appears to be an amount sufficient to cover at least the output costs. These demands are entirely off-peak, if the co-incident peak formed by fire and general service is considered, in that no water is, or need be, used for these purposes at times when a large fire demand is exerted. If the general service only is considered, sewer flushing and street sprinkling undoubtedly do affect the maximum demand of this service, but as the plant is designed to carry both the fire and the general demands, it is equitable to apportion capacity expenses only to those classes of service which may affect the simultaneous peak. Basing our calculations upon the output cost per 1,000 gallons delivered at present, we find that if the water used for flushing and sprinkling is charged for at a rate which will return only that output cost, the revenue from sewer flushing should be about $216.67 per year, assuming that the amount used is 5,000,000 gallons per year. If the amount used is less than this, the annual revenue from this source should be less. In that case, it seems that more water is used by other flat rate consumers and more revenues should be derived from them. During the year ending June 30, 1910, the receipts from street sprinkling were $578.05. Although this amount is somewhat below the output cost of 15,000,000 gallons of water, it is close enough to appear just, especially in view of the fact that 15,000,000 gallons is an estimate which may be somewhat in error.

Public buildings, schools and churches should be charged for water on the same basis as other consumers. There can be no justification for an extension of the flat rate plan when the utility is financially able to install meters, and when the conditions under which water is to be used are such that meters may be advantageously placed. All public buildings, schools and churches should be metered and charged the same rate as other consumers.

The amount of water flowing through public fountains is about 12,000,000 gallons, which would make the output cost alone $520 on the basis of the amount of water used at present, or $618 based on estimated cost with the system completely metered. All of these fountains should be charged for, and a flat rate of $45 per fountain per year appears equitable, although meters may be more satisfactory to both parties.

Water used for building purposes, for sidewalks, etc., should be paid for at rates which are as nearly equitable as possible. As water for these purposes is used through services which are already being charged with their share of capacity expenses, it would seem that a proper charge for this service would about equal the output cost of supplying the water. Here again, however, we are confronted with the fact that it is almost impossible to state how much water is used for building purposes, even without considering the amount of waste. An investigation of this matter by the engineering staff indicates that, even with a very liberal allowance for waste in connection with the use of water for these purposes, the amounts which are used for the various purposes are so small that the present rates are in general unreasonably high. Owing to the fact that the waste may be and very often is excessive, rates for such uses of water as building purposes cannot and should not be based merely on the cost of water actually entering into the construction. A readjustment of rates for water used for construction purposes, about as indicated below, appears to be entirely just to the utility. It is possible that rates might be even lower, but the following appear reasonable:

Lime or cement, per barrel	$0.02
Stationary steam engines, working not over 10 hours per day, per horse power	3.00
Laying stone, per cord	.05
Laying brick, per 1000	.05
Laying cement side walk, per lineal foot	.005
Paving, all kinds, 36 ft. wide, per lineal foot	.01
Sewer work, cement curb and gutter, per lineal foot	.005
Plastering, per 100 sq. yds	.10

Just how great an effect these reductions in rates for water used for construction purposes will have, cannot be stated, but the average annual revenue will probably not exceed $300. Where it is practicable to use metered services to obtain this water, no charge should be made by the company excepting the regular charge for metered water.

The total cost of general service, exclusive of interest and depreciation on meters and services, is $22,928.73. Interest and depreciation on meters and services amount to $1,796.39, of which $1,484.10 is a cost of metered service, and $312.29 a cost of unmetered service. The revenue to be derived from metered users in a year under meter rates as outlined, is $11,748.99. Of this, $1,484.10 is required for interest and depreciation on meters and services, leaving $10,264.89 as the share of the $22,928.73 which is borne by metered consumers. This leaves $12,663.84 as the amount to be derived from uses which are at present unmetered, together with $312.29 of the cost of interest and depreciation on services, making the total cost of unmetered service $12,976.13. The total revenue derived from flat rate consumers during 1910 was $14,264.55, but this included $300 which was derived from private fire hydrants and public fountains which have been excluded from this group, so that the total revenue from flat rate consumers in the group was $13,964.55.

The table shown on page 674 gives the number of flat rate consumers of each class, including only those who were active consumers during 1910.

It will be noted that the total number of services does not correspond exactly with the numbers used in the foregoing statements of what revenue should be derived from flat rate consumers, due to there being a doubt in a few cases as to whether individual consumers were or were not active consumers during 1910. The number of first faucets listed is not in every case the actual number, but rather the number that there would be if each consumer actually had a faucet. For most of the flat rate consumers the rate is based on the assumption that there is a faucet for each consumer, and it is this condition which the table is intended to show. The number of rooms as listed is the sum of the number of rooms in excess of five in all residence and apartment houses.

There are certain classes of flat rate users for which no flat rate can be made which will be equitable. The amounts of water used by stores, saloons, restaurants, etc., are so dependent upon elements other than the nature and number of fixtures, that a rate based upon fixtures can never be satisfactory. The park and cemetery which are listed among flat rate users, paying respectively $150 and $250 per year, are also users whose annual consumption can hardly be estimated, but it is probably much greater than the present rates are sufficient to pay for. These services should be metered and charged according to the amount of water used.

FLAT RATE CONSUMERS—1910.

JANESVILLE WATER COMPANY.

Class.	½" services.	⅝" services.	¾" services.	1" services.	1½" services.	2" services.	4" services.	6" services.	First faucets.	Additional faucets and wash basins.	First water closets	Additional water closets.	Baths.	Barber chairs.	Hose.	First horses.	Cows and additional horses.	Fires.	Urinals.	Boilers.	Beer Pump.	Rooms.	Miscellaneous.	Hydrants.	Soda fountains.	Motors.	Number of apartments.
Warehouses, etc.	1		9	1					11	3	4	2															
Restaurants	1		4						5	2	3	1															
Barber shops		1	8						9	10	4		2	2									1				
Halls	2		5			1			8	4	7	3			2												
Photograph gallery	1		2						3	1	2																
Barns	1		8	1												10	22										
Blacksmith shops			1						1									1									
Blocks			1	2					3	41	3	14	1						4	1							
Saloons	3	1	20	1					25	12	25	3	1		2				19		5	2					
Offices	4	4	30	1	1				40	9	20	2							2								
Park			2	4																							
Cemetery							1																				
Fair grounds						1			1																		
Outside fire protect'n							1	2																6			
Inside fire protection								1																			
Residences	212	79	1094	9					1393	209	433	11	163			10	4					2130					
Flats	2		9						11	4	3		1									19					26
Stores	4	9	88	7					108	19	78	3			1	1			1						2	1	

Even among the residence consumers the amounts of water used, even where the same number of fixtures is used, varies enormously, depending upon the degree of care exercised by the consumers, their attitude towards the utility, the condition with regard to sewer connections, and the leakiness of fixtures. The total revenue obtained from flat rate consumers listed in the above table, exclusive of private fire hydrants, was $13,964.55.

In the case of some classes of flat rate consumers shown in the foregoing summary, the charges do not appear to have been made according to any schedule. For example, register number 913 is a warehouse with one faucet, and the annual payment is $10; number 265 is a warehouse with a single faucet, for which the annual charge is $7; number 860 is a warehouse with two faucets and two water closets, for which the annual payment is $17. These charges are not made in accordance with any schedule that we are able to find. The variations are probably due to the difficulty of classifying such consumers under any of the divisions of the flat rate schedule. This same trouble has arisen in a number of instances in the case of stores. All consumers whose premises or whose uses of water are such that they cannot be classified logically under one of the general headings of the flat rate schedule, should be placed on a meter basis.

As there is no way of knowing how much water is used by any fixture or by any consumer on a flat rate basis, no readjustments of rates can be made which will bring the revenues from each consumer into line with the cost of his service.

The total revenue from unmetered general uses of water during 1910 was $14,264.55; the amount which should be obtained under the new schedule is $12,976,13. This indicates that some reduction can be made. The $12,976.13, shown as the amount which should be obtained from this class of service, includes a number of uses which are free at present and a number of uses which it may be well to consider apart from the general list of unmetered consumers. Although it is not possible to state exactly what revenue will be derived from services which are now supplied free, the following list represents an estimate which it is believed is sufficiently accurate to be used as a basis for revising the flat rates:

Street sprinkling, at present rate	$578.05
Public fountains, 12 at $45	540.00
Water for construction purposes, estimated,	300.00
Schools, etc., estimated	450.00
Total	$1,868.05

The statement of $14,264.55 as the revenues from unmetered use during 1910, does not include any of the above, except $150 for water furnished to public fountains and $150 from private hydrants, so that the total revenues, excluding all of the above uses, were $13,964.55.

With a total of $12,976.13 to be derived from unmetered uses, and probable revenue of $1,868.05 from uses listed above, it follows that the amount to be derived from other sources is about $11,108.08, indicating that a total reduction of about $2,800 per year could be made in the revenues from general flat rate users if flat rates were to be continued.

If no extension of the meter system were contemplated, it might be well to make a more or less general cut in flat rates in accord with the facts as presented above. It is, however, the duty of the utility to sell to all consumers through meters unless exempted from so doing by the Commission. Although no demand has been made in this case for a general extension of the meter system, this fact does not remove the company's obligation to install meters. It may not be necessary to put in meters where the premises supplied have no sewer or cess-pool connection, but in all other cases meters should be installed. If flat rates are to be superseded by meter rates in all cases where premises have sewer or cess-pool connection, it seems that the flat rate plan will be very largely discontinued. About the only readjustment which need be made in flat rates seems to be as follows:

Charge for rooms in excess of five to be reduced from 75 cts. to 50 cts. per year. Charge for baths in residences to be reduced from $4 per year to $3, and an equal reduction in the rate for water closets. The reduction in the rate for baths and water closets will affect these only temporarily, as all premises supplied with these fixtures will be metered. As meters are to be very generally installed, no further alteration of the flat rate schedule need be made. If the flat rate plan were to be continued in force as amended, the revenues of the utility would be about as follows:

Fire protection and flushing sewers	$15,800.00
Construction work and public uses	1,868.05
Metered	11,748.99
Unmetered, with reductions outlined above	12 828.30
Total revenue	$42,245.34

If rates were made as outlined in the foregoing pages, the revenues, if flat rates were to continue, would be somewhat above the cost of service. The total cost of general service is $38,724.14 per year, exclusive of interest and depreciation on meters and services, which brings the total up to $40,520.53. According to this estimate, if flat rates were to be generally continued, the revenues might be regarded as excessive. As it is difficult to tell just what the effect of the introduction of meters will be, it seems that rates as outlined above should be put into effect. Operating expenses and depreciation have been conservatively stated in determining the cost of service, and although the revenues are likely to be somewhat above the cost of service, the information now available does not seem to justify a set of tentative rates lower than those outlined above. Besides this, it is but just to the utility to call attention to the fact that its administration and management appear to have been very efficient and economical, with the exception of the excessive allowance for salaries, which was revised in making up the statement of expenses. Also it should be remembered that the amount of water used by public buildings and churches may be less than the estimate made above, which would reduce the revenue from that source. It is doubtful, also, whether as much as $300 per year will be obtained from sales for construction purposes. In view of these conditions, we believe that the schedule of rates should be as follows:

As the amount of water used for sewer flushing is very problematical and very likely to be less than our estimate, a total charge for fire protection and sewer flushing of $15,800 per year is just to both the city and the utility.

Flat rates should remain as at present, except that the charge for extra rooms should be 50 cts. each, and baths and water closets should be reduced from $4 to $3 per year.

Public fountains should be charged for at $45 each per year, or metered; schools, public buildings, and churches should be metered.

Street sprinkling should remain as at present.

Water used for construction purposes should be charged for as follows:

Lime or cement, per barrel	$0.02
Stationary steam engines, working not over 10 hours per day, per horse power	3.00
Laying stone, per cord	.05
Laying brick, per 1000	.05
Laying cement sidewalk, per lineal foot	.005
Paving, all kinds, 36 ft. wide, per lineal foot	.01
Sewer work, cement curb and gutter, per lineal foot	.005
Plastering, per 100 sq. yds	.10

Meter rates should be made up of a charge of 7½ cts. per thousand gallons for the first 50,000 gallons per quarter, 5½ cts. per thousand for the next 50,000, and 4 cts. per thousand for the excess, and a service charge as follows:

Size of meter.	Quarterly service charge.
⅝ inch	$1.50
¾ "	2.00
1 "	2.50
1½ "	4.50
2 "	6.00
3 "	12.50
4 "	18.00

Rates as computed above allow the utility to earn an amount sufficient to cover interest and depreciation on services which it has put in at its own expense.

With regard to the meters, however, it is practicable to provide that the utility pay a rental to consumers who have installed their own meters, or else purchase all such meters. As the company has been allowed to earn a return for interest and depreciation on all meters, it is only fair to provide that in cases where consumers own meters the company shall pay a rental equivalent to the amount of interest and depreciation. Such rentals would be as follows:

Size of meter.	Annual rental.
⅝ inch	$1.50
¾ "	2.60
1 "	3.70
1½ "	6.00
2 "	7.80
3 "	16.20
4 "	19.20

Justice to those consumers who own their services and meters would seem to require that they should receive a rental from the utility sufficient to meet the expense of interest, depreciation and taxes, as provided for in the earnings of the utility.

At it does not seem possible to determine what services are owned by the utility, it has seemed best, for the present, to include in the valuation upon which consumer expenses were based only the amount which the utility has invested in services.

The following table shows the annual charge for water, if rates are fixed as outlined above, for a number of consumers having meters of different sizes, taken from the list of metered consumers submitted by the company:

Register number	Size of meter	Class.	Gallons used in 1910.	Total charge in 1910.	Annual charge under suggested rates.
1060	⅝	Residence	2,474	$10 00	$6 19
1850	⅝	"	13,926	10 00	7 05
1522	⅝	"	30,344	11 14	8 27
1946	⅝	"	62,019	21 71	10 65
1919	⅝	Apartment house	188,063	61 66	19 64
887	⅝	Livery stable	191,693	62 16	20 00
67	⅝	Hotel	347,093	92 51	28 49
853	⅝	Office	18,525	10 39	7 39
227	⅝	Saloon and residence	48,318	20 21	9 62
1618	⅝	Factory	204,434	65 69	20 99
1577	⅝	"	311,739	88 65	27 14
1359	⅝	Residence	44,192	15 46	9 42
1980	⅝	"	49,066	17 17	9 68
430	¾	Saloon	44,581	15 60	11 35
991	¾	Residence	31,469	11 43	10 36
2048	¾	Brewery	100,457	35 15	15 54
296	¾	Factory	428,709	112 69	32 71
1890	¾	Office	292,734	78 14	28 03
2092	1	Greenhouse	478,141	119 26	38 96
574	1	Passenger depot	841,194	195 49	53 64
315	1	Factory	1,537,088	334 18	81 48
1729	1½	"	725,873	169 45	57 04
891	1½	"	416,780	112 31	43 26
2166	2	Water tank	9,240,020	461 98	403 60
1018	3	Brewery	65,850	25 14	54 78
2081	4	Roundhouse	61,282,650	3,064 12	2,533·31

IMPURE WATER SUPPLY.

The portion of the complaint in this matter which relates to impure water supply reads as follows:

"Said plaintiff further shows, upon information and belief, that said water company does now unlawfully and for several years last past has laid and maintained one or more large surface pumps in the bed of Rock river, together with a large number of pipes driven in the bank of said river near the pumping station of said company, from and through which said company pumps large quantities of water into their main which carries the artesian water pumped from said artesian well of said company to their consumers; that the water pumped from all said surface pumps is impure and unwholesome and unfit for human consumption; that large quantities of sewerage are emptied into said river in said city, above and near where said surface pumps are situated, which is collected by a sewerage system laid from public buildings, hotels, office and flat buildings, railroad depots and private houses."

Just what is meant by surface pumps installed in the bed of Rock river, we are unable to state, but it seems that the essential part of this portion of the complaint is the charge that impure water is pumped from the river, without regard to the means employed. An investigation of this matter was made by the engineering staff of the Commission, and their report shows that it is impossible for the Janesville Water Company to pump water from the river into the city mains; neither could any trace be found of pumps laid in the bed of the river. There is an open well at a short distance from the river, containing 24 2″ well points, and 57 1½″ well points, but there are no pipes driven in the bank of the river through which river water can be pumped into the mains.

OWNERSHIP OF METERS AND SERVICES.

The cost new of all meters and services on the system of the respondent is $33,690, and their present value is $28,789. Of the total the company owns meters with a present value of $530 and a cost new of $644. The respondent's records also show that at the time of the construction of the plant about $5,800 was invested in services, but the company's officials expressed their inability to determine what services were owned by the utility and what by the consumers.

There appears to be little ground for disputing the statement that meters and services from the main to the curb line should be owned by the utility and not by the consumer. In its investigation of the *Hudson Water Works*, 3 W. R. C. R. 138, the Commission held that the utility and not the consumer should own the meters. The same line of reasoning seems to apply in the case of services. We quote from the decision in the *Hudson* case (pp. 141, 142):

"The law clearly contemplates that the divided ownership of parts of the equipment of public utilities shall cease, and that all responsibility for the installation and maintenance of the whole of the equipment shall be centered exclusively in the management. * * * Under the Utilities Law no utility can compel a consumer to acquire by purchase a meter, or any other part of the facilities which properly belong to the body of facilities which the utility is expected to furnish."

The question as to who should own meters appears to be settled. The only point to be decided here is whether or not services are a part of the facilities which the utility is expected to furnish. The logical conclusion seems to be that the utility should install and own services to the curb line. The utility, and not the consumer, has the right to occupy the streets, and all pipes laid in the streets should be the property of the utility, and we believe should be put in by the utility. The business of the utility is to deliver its product to the premises of the consumer. If the utility should own the mains through which water is carried to various sections of the city, it seems equally true that it should own all parts of the distribution system as far as the consumer's premises. The service pipe from main to curb is as much a part of the utility's distribution system as is the main itself. Both parts of the equipment have the same purpose: the delivery of water to consumer's premises.

It is not believed that the utility should be required to install and own such portions of the service as are on private property. True, the utility very often owns meters, which are installed on consumer's premises, but such installation is done as a matter of convenience to the utility. As the purpose of the utility is to deliver water to the premises of the consumers, if other conditions were equal, the logical place for the meter would be at the property line. Piping inside the curb line stands in very much the same relation to the utility as does the piping and plumbing in buildings, and should be a part of the property of consumers.

REASONABLENESS OF RULES AND REGULATIONS.

Aside from the matters already considered, the first complaint alleged that all of the rules, regulations and rates of the water company are unreasonable, unjust and exorbitant, and that the company enforces its rules and rates by shutting off the water supply of any patron who refuses to observe the rules or pay the rates as charged, and refuses to again turn on water until the consumer conforms to its demands and pays an additional charge of one dollar.

A careful examination of the rules and regulations shows that they are, in general, reasonable, and such as appear necessary to properly regulate the relations between the utility and the consumer, but there are certain of the rules whose reasonableness may be open to question. These are as follows:

> "Rule 7. Any fixture located in any hallway or other public place will be rated for the full amount that would be chargeable to different parties having access to the said fixtures at the same rates that would be charged if each of the parties had the same fixtures independent of each other."

This rule is evidently intended to apply to such a case as that of two or more offices, all of which are supplied through the same fixtures, such as a common faucet in a hallway. In this case the rate for a single office is $7 per year, and under this rule each additional office will be charged the same amount. The basis upon which such a rule has generally been upheld is, that the charge is in the nature of a minimum charge, which may be made the same for each consumer. A strict adherence to the cost principle may not justify the practice as outlined by this rule, but, in all probability, the application of the cost principle would not justify the continuance of any individual flat rate. The whole flat rate plan is inherently defective, in that it takes little or no cognizance of the cost principle, its chief end being to produce a sufficient amount of revenue, with charges, theoretically at least, based on the consumer's ability to pay. Although it may not be practical to entirely and immediately abandon the flat rate plan, it is clear that its worst features should be corrected by the installation of meters. As the theory upon which flat rates are based is that of the value of the service and the ability to pay, it is probable that the rule in question should not be modified as long as such classes of service are to be supplied on a flat rate basis. As long as each consumer has the option of having fixtures in his own office at the same rate, no injustice appears to exist in the present system of charging. The proper extension of the system of metering would seem to furnish the best means of overcoming any difficulties which may arise.

"RULE 8. SEC. 7. When consumers neglect to comply with the rules regarding sprinkling, or allow waste of water, the company will require meters to be set, or discontinue the lawn service. Should the consumer refuse to furnish a meter or discontinue the lawn service after notice, the water will be shut off."

At the present time, according to the consumer data submitted by the company and the statement of its superintendent, all consumers who have lawn service are supplied on a meter basis. This rule will necessarily be changed, in the light of what has been said in the preceding pages, to provide that all meters hereafter installed shall be owned by the utility.

"RULE 9. Meters in buildings or flats which serve more than one tenant will be charged the minimum rate of $2.50 for each quarter, for each tenant so served."

This rule is amended by the order in this case establishing a schedule of meter rates.

"RULE 13. Any person or corporation neglecting or refusing to comply with the foregoing rules and regulations is liable to have the water supply shut off, and it will not again be turned on until an additional charge of $1 is paid."

If the rules and regulations which this rule is designed to assist in enforcing are just, it is hard to see where there is anything unreasonable in such a rule as this. It is merely a measure of protection against consumers who are unwilling to conform to reasonable rules. Practically every utility has a rule analagous to this regulation, and it is generally considered just. Certainly no injustice is done to consumers who comply with the rules and regulations of the utility, and if consumers do not comply with such rules and regulations, assuming that such requirements are reasonable, it is difficult to see where there is any injustice in applying such a protective regulation as this to such consumers.

EXTENSION OF DISTRIBUTION SYSTEM.

With regard to the extensions of the distribution system as ordered by the city council, the applicant stated that these were designed primarily to improve the fire protection and to furnish domestic service to consumers who are not supplied, but it was also urged that the extensions should be put in now so that street improvements could be made without making it necessary for the water company to lay mains after improvements were in, and further, that some of the extensions were needed in order to secure better circulation of water in the mains. The question of street improvements was taken up with the city engineer of Janesville, who stated that no street improvements were contemplated which would make it advantageous to have the extensions made, as ordered by the city.

An investigation by the engineering staff shows that only two of the proposed extensions are at all necessary in order to furnish ample fire protection. The only matters to be considered with regard to the other extensions, then, are the questions of domestic service and of circulation in the mains. The extensions which were ordered by the city for the purpose of bettering the circulation, are the following:

1. On St. Mary's avenue, from Prairie avenue to Milton avenue;
2. On Lincoln street, from Galena street to Washington avenue.

The proposed extension on St. Mary's avenue would join two six-inch mains on Prairie avenue and Milton avenue, which extend about 1,300 feet and 1,400 feet, respectively, beyond the points at which the new main would intersect them. It seems that all of the complaints regarding poor circulation in the mains in this locality come from consumers on Prairie avenue and Milton avenue beyond the points at which the proposed extension would join the existing system. The extension as ordered by the council would not relieve this condition. As there seems to be little or no complaint regarding circulation in the mains on Prairie and Milton avenues within the area which would be affected by the St. Mary's avenue extension, it is clear that this extension is not needed and will be of little or no value, so far as its effect on circulation is concerned.

The extension which has been asked for on Lincoln street, from Galena street to Washington avenue, would relieve a dead end of a six inch main extending one block, from North street to Galena street, but would not relieve the dead end of the six-inch main from Washington avenue to Western avenue. No specific complaints have been entered relating to the character of the water in the main from North street to Galena street, but there is no reason to believe that the condition is any more unsatisfactory than that existing on numerous other dead ends where no extensions are contemplated. There appears to be no need of increased fire protection at this point, as there are hydrants on Lincoln street at the intersection of Galena street and Washington avenue, each of which is supplied with water from separate mains. The proposed extension would not add to the number of hydrants available, nor very much to the supply for existing hydrants. Furthermore, there has been no complaint regarding the adequacy of the supply of water for fire protection at this point. A careful canvass of the block on Lincoln street, to be served by the proposed extension, failed to show that a single consumer would be added to the list of those supplied by the utility. There are nine houses in this block which might be supplied, but of these seven are occupied by parties who stated that they would not use water from the mains of the utility, even if the extensions were put in. In one case the owner of the house said that a connection might be made, but that there was no certainty regarding it, and the owner of the other house could not be seen.

The engineer's estimate of the cost of laying a two-inch main on this street, to supply domestic services only, is $130, and $300 for a six-inch main. As there is no need of increased fire protection at this point, and no certainty of any revenue from domestic users, and as there seems to be little ground for complaint regarding lack of circulation, it does not seem that this extension need be put in at this time.

The company has installed the four-way hydrant at the corner of Race and Academy streets, as ordered by the council.

On Milwaukee avenue a two-inch main has been laid, so this part of the complaint has also been settled.

On Pleasant street, within a distance of 800 feet westerly from the Grant school, there are but three residences, and a canvass of the residents showed that none of them would become patrons of the water company in the event of the extension being made as ordered by the city. Reasonably adequate fire protection can be furnished to this section from a hydrant located at the corner of Pleasant and Palm streets. This extension would cost about $255 for domestic service only, and about $700 if a six-inch main is installed to extend the fire protection area, but as there is no demand for water for domestic use, nor any need of an extension for purposes of fire protection, it does not appear necessary to have this extension made at this time.

On North River street the city has ordered an extension from Mineral Point avenue northwesterly about 700 feet. There are hydrants at both ends of this line on dead ends of mains. The buildings in the vicinity are mostly small residences, and there already appears to be ample fire protection. The fire chief does not urge the laying of this main. It is understood that a sewer has recently been laid through this block and it was contended that a few parties desired water service from the proposed mains.

A canvass of the district to be supplied showed only one consumer who would take water from the proposed main, a five room house, in which water would be used for bath and water closet only. One vacant house was also found of about six rooms which, it was stated, the owner was unable to rent because there was no water supply. Nothing could be learned, however, as to what fixtures would be installed, and there may even be a doubt as to whether water would be used from the main by this house. One house on this street is supplied by a pipe laid from the main on another street.

The soil through which the proposed main would have to be laid is such that a large part of the work of laying the main would be rock excavation, costing in the neighborhood of $875 in all, for a two-inch main. With only two probable consumers, both of whom have small houses, it needs no very extended computation to show that revenues would fall very far short of a reasonable return upon the investment necessitated. This extension would relieve the dead end of a six-inch main on Mineral Point avenue, and of a four-inch main on Olive street. Both of these dead ends, however, are short, and supply few consumers, and no complaint has been made concerning the quality of the present water supply in these mains. This extension does not appear necessary.

The extension on North Bluff street extends 300 feet from Fourth avenue to Pease's court, and northeasterly on Pease's court 400 feet. The district is entirely a residence one. The adjacent streets paralleling Pease's court on the north and south are only 320 feet from it, center to center, and both have fire service mains and hydrants. Any fires in Pease's court would be easily reached by hose leads of moderate length from existing hydrants on Fourth street on the north, Prospect avenue on the south, or the corner of Main street and Pease's court. The fire chief does not recommend the laying of this main.

It is clear from the facts relating to fire protection in this vicinity that the Bluff street and Pease court extension is not needed for fire protection at the present time. In order to determine whether an extension should be put in for domestic service, a canvass was made of the district. On Pease's court four residences are within the district to be supplied, but all of these are at present supplied from Prospect avenue, so that there appears to be no need whatever for the extension on Pease's court at the present time. On North Bluff street there are five residences and a small church which might be supplied by the 300 foot extension, but two of these are now supplied with water from the main on Fourth avenue. The other three residences will not be connected with the main if the proposed extension is made, although it was learned that one of them might be connected at some future time. The church may or may not be connected. It is now supplied by a well, and probably cannot be counted as a consumer. As there is no certainty of there being even a single consumer on this extension, it is apparent that no order should be made to have it put in at present.

The extension on St. Mary's avenue from the center line of Prairie avenue to Milton avenue, to connect with six-inch mains on these streets, will be 1,030 feet in length. In connection with this extension it was felt that on account of the apparently high elevation and the distance from the plant, the hydrants on St. Mary's avenue at the intersection of Milton and Prairie avenues, between which the extension has been ordered put in, might give inefficient fire service, and a fire test was made at the corner of Milton and St. Mary's avenues. We quote the following from the report of the Commission's engineer:

"A pressure gauge was installed on the hydrant at the above mentioned corner, leaving one still installed at the pumping station, and a single fire stream taken from the hydrant through 300 feet of 2½" hose and an 1⅛" smooth nozzle. The hose line reached a point about midway between the extremities of this proposed main. Direct pressure from the pumps was called for by telephone, and the chart made by the recording gauge at the plant shows an average pressure of about 120 lbs. per square inch, while that at the hydrant was about 75 lbs. The stream was such as to throw approximately 200 gallons per minute and reach a height of 60 feet in still air, or be effective in a moderate wind at a height of nearly 50 feet.

"The buildings in that locality are mostly two-story frame dwellings of moderate size, of good construction, and Mr. Cline, the fire chief, stated that one stream was all that he would use on a fire in a residence of that kind, also that the stream furnished by the water company in the test was as good as he would want under such circumstances.''

As it seems clear that there is no need of the proposed extension for purposes of fire protection, it is clearly unnecessary to put in a large main, even if it is found that domestic service should be furnished. It appears that a two-inch main will be large enough to supply all domestic service in this district. The engineering staff estimates the cost of putting in a two-inch main from Prairie avenue to Milton avenue at $330.

From a canvass of the district in question it appears that six consumers will be supplied with water from the proposed main. Of these three are already patrons of the water company, receiving their supply through a three-fourths inch pipe laid from the main on Milton avenue to the first three houses on St. Mary's avenue. Of the other three, two are on St. Mary's avenue, and the third is a house fronting on another street, but which could easily be supplied by a service pipe laid from a main on St. Mary's avenue. In addition to these, there is a new house being constructed which may be connected to the main if the company is required to lay a main along this street. That there will be at least six consumers, including the three who are now supplied through the privately owned pipe from Milton avenue, appears to be clear.

There may be some question as to whether the three consumers on St. Mary's avenue who are supplied through the private pipe line should be taken into consideration in computing the revenue to be derived from consumers on the proposed main. As far as these three consumers are concerned, the utility will receive the same revenue which it has at present. An examination of the situation, however, seems to indicate that these consumers should be included in computing the revenues from the extension. It is not an uncommon practice for parties desiring water to lay small pipes at their own expense in order to secure the supply. If this practice was carried out to its logical completion, the entire distribution system would be put in at the expense of the consumers. The mere fact that certain patrons have installed portions of the water distribution system which should have been installed by the company, ought not to prove a barrier to further extensions. It is a fact which does not seem to need discussion at this point, that a water utility should construct and own its distribution system, at least as far as the consumer's premises. This being the case, it is difficult to see by what process of reasoning it can be held that the fact that the utility has in the past shifted upon consumers a portion of its rightful duties, the installing of parts of the distribution system, should stand in the way of the utility putting in a main or mains at the present time. The most natural way to supply the three consumers in question would appear to be from a main laid on St. Mary's avenue.

If consumers, who have a supply of water under circumstances such as those under which these three consumers have their supply, are not to be included with new consumers in making a statement of the revenues from the proposed extensions, it may be impossible to secure extensions through certain districts, even when the condition of the district as a whole justifies the extension. The only logical method seems to be to include in the computation of revenues the total from all consumers who would naturally be supplied from the proposed extension.

The total annual revenues from the three consumers already supplied is $23.50. Aside from these there are two houses on the line of the proposed extension, the owners of which stated that they would become patrons of the water company, and there is a house on Yuba street which will also be added to the list. The two new consumers on St. Mary's avenue, under the existing rules of the utility, will be on a meter basis, and according to the ruling of this decision regarding meters, the house on Yuba street will also be supplied through meter. The average annual use of water by residence consumers on a meter basis is 37,068 gallons. If a 5/8 inch meter is used for each of these residences, the probable annual revenue will be about $24 or $24.50, making the total revenue from consumers on the extension, without counting in the house now being built, about $47.50 or $48 per year. As stated above, the cost of the extension will be about $330, or $55 per consumer. None of the cost is chargeable to fire protection.

It does not seem necessary to discuss at any great length in this decision the principles underlying the determination of the reasonableness of orders relating to extensions for domestic service. These have been quite fully discussed in former decisions, especially in *Beloit Water, Gas & El. Co. v. City of Be-*

loit, 5 W. R. C. R. 617, 623. The general principle as outlined in that case is as follows:

> "In determining questions of the kind involved here, due consideration should be given, not only to the interests of the utility, but to the interests of the consumer and the public. These interests, however, as well as the conditions upon which they depend, vary so much from place to place that it is difficult, if not altogether impossible, to lay down specific rules for extensions of the plant and the business that can be generally applied. In a general way it can, of course, be said that such extensions as the one in question here should be put in at the expense of the plant whenever they bid fair to become fairly remunerative. * * * the term 'fair remuneration' may not always stand for like elements. * * *. In most instances, however, it is likely to mean that the gross earnings from the additional consumers should be high enough to place them on about the same footing with reference to the cost of the service as that which obtains from the rest of the consumers of the plant who come in the same rate classes in its regular rate schedules."

Owing to the use of the flat rate plan upon many of the services in Janesville, it is difficult to state how much water will be used per year by the six consumers on the new extension. It appears, however, that the total annual use of water will be about 240,000 gallons, although if all are metered it may be somewhat less than this.

It was estimated above that 250,000,000 gallons per year would be delivered to consumers if all were metered. Also, it was found that of the $22,928.73 of expenses of general service, $12,449.99 were direct operating expenses, and $10,478.74 were interest, depreciation and taxes, with interest at 7 per cent. The direct operating expenses, then, amount to very nearly 4.98 cts. per 1,000 gallons, although the decreased pumpage expenses might bring them somewhat below this figure, and interest, taxes and depreciation to 4.19 cts. per 1,000 gallons. Nine cents per 1,000 gallons seems to be a safe estimate of cost, taking account of saving resulting from decreased pumpage.

If we assume that 240,000 gallons per year will be required by consumers on the proposed extension, the total cost will be $21.60. This amount does not include the interest and depreciation on the main, on services, and on meters. Interest and depreciation on services and meters will be about $8.50, figuring that three consumers will be on a meter basis, as was assumed in figuring the revenue from the new extension. This makes a total cost of $30.10, exclusive of interest and depreciation on the main. If all consumers were metered, the cost would be about $34.60. These items will amount to about $26.40, if interest is computed at 7 per cent and depreciation at 1 per cent. This should not be taken to mean that in every case the cost of the new main should be entirely met by the consumers directly served by that main. This is true especially in cases where a main is so situated that further extension of it may be made as occasion arises. In such a case the main not only serves to supply the consumers situated along its present course, but will serve the purpose of conveying water to other portions of the distribution system. In such cases it is not possible to isolate the cost of each portion of a main and charge the interest and depreciation directly to the consumers along its course. Since most portions of the distribution system fulfill a function other than the supplying of water to consumers immediately along their course, a rate schedule should consider that parts of the system are interdependent, and treat the system as a unit.

In the present case there may be some justification for disregarding, at least in a partial degree, the general rule as outlined in the preceding paragraph. The extension serves practically no purpose except to supply consumers immediately along its course. Of course, it will to some extent improve the circulation in the mains on Prairie and Milton avenues, but it is doubtful if this is a very important function. As the main, if laid, will be only a two-inch pipe, so situated that it will never be used as a supply main to carry water to other and more distant portions of the system, it would seem to be analagous to the service pipe or the meter supplying an individual consumer. Its sole function, for all practical purposes, is to deliver water to consumers directly along its line, just as the function of a service pipe is to deliver water to the premises of an individual consumer.

In view of these facts there may be some justification for considering, in this particular case, that interest and depreciation on the extension should be met by the revenue from consumers whom it will serve. Even if we assume for the moment that this view is the correct one, we find the total cost to the utility of supplying 240,000 gallons per year to consumers along this line to be $56.50, assuming that only three consumers are on meter. The probable revenue will be $47.50 or $48 if these consumers are unmetered. If all six are metered, the cost of supplying water would be about $61, and revenue probably $54 per year.

In the foregoing computation we have assumed an interest rate of 7 per cent throughout. In the Beloit decision cited above, the Commission said: "Six per cent as an initiatory rate on the value for extensions on which the business and the returns are likely to increase as additional consumers are taken on, would not seem to be unreasonably low." If a 6 per cent interest rate had been used throughout in the foregoing computations, the total cost to the utility, even including interest and depreciation upon the entire cost of the extension, would be approximately $50, even with all consumers on a meter basis.

The new extension would appear to be reasonably profitable to the utility, and there seems to be no doubt that it is demanded by consumers. The district to be served is one which is developing, and there seems to be no question that this extension should be put in. It does not seem necessary to make an extended analysis of the costs, as, even assuming that all the costs including interest and depreciation on the main itself should be met directly by the parties to be supplied, there is a reasonable return. The conditions in Janesville do not seem to indicate that more than 240,000 gallons per year would be used by consumers on this extension. The actual use will probably be less than this amount. Furthermore, if more than the estimated amount is used by metered consumers, the company profits by the increased use.

The extension which has been ordered by the city from the present terminus of the mains on Walker street westerly to the corner of Sutherland and Walker streets, to connect with the main at that point, appears to have been ordered for fire protection only. There are no houses or other prospective domestic or industrial consumers along the line of the proposed extension. In order to determine whether the present fire protection is adequate, a test was made by the engineers of the Commission on May 26, 1911. We quote portions of the engineer's report regarding this fire test:

"In the west half of the block bounded on the east by Hickory street, on the south by Hyatt street, and on the north by Walker street, the Hanson Furniture Company has a four-story brick main building 50x100 feet, with a two-story brick addition 50x60 feet, and sheds, dry kilns, and other adjoining buildings, and lumber piles. In the east half of the same block with the factory are a few small dwellings. The neighborhood is, however, rather thinly settled as yet. The fire and other water service for the neighborhood is supplied from a single line of six-inch pipe extending from the corner of Fourth and Bluff streets, where it is taken off an eight-inch line, northward on Bluff, Glen, and Hickory streets to St. Mary's avenue, where it is dead-ended, having a total length of 3,000 feet, exclusive of a dead-ended branch extending east on Walker street about 550 feet. The hydrant nearest the furniture factory is at the corner of Hyatt and Hickory streets, being about 1,900 feet from the southerly end of the six-inch main where it leaves the eight-inch. This hydrant is probably about 200 feet east of the factory building. The next nearest hydrants are, one about 300 feet north and one about the same distance south of this one. They are double discharge hydrants, each for two lines of 2½″ fire hose. Arrangements for the test were made with Mr. H. C. Cline, chief of the fire department, and notice was given to Mr. Hyzer, superintendent of the water company, shortly before the test was begun. No fire alarm box was pulled, the call for direct pressure being sent to the pumping station by telephone when preparations were completed. Two streams were carried to the factory, one from the hydrant at Hyatt and Hickory streets, and one from the hydrant next south. The line from the latter hydrant was doubled for two lengths of hose, or about 100 feet, and the two leads siamesed into a single line about 500 feet long. The two lines of hose from the former hydrant, each about 250 feet long, were siamesed into one length of about 50 feet, the object being to reduce the pressure losses from friction in hose to a minimum, and to determine approximately what are the best results to be expected in the way of fire service from the existing water system at this point. Not enough hose could be spared from the fire department stations for use in this test to run two lines from each hydrant for the full distance to the building, as would probably be done in case of a fire, in order to avoid as much loss from friction in hose as possible.

"Pressure recording gauges were connected to the water mains at four points for this test, as follows:

"At pumping station, gauge B.

"At hydrant, corner 4th & Bluff streets, gauge G.

"At hydrant, 300 ft. south of corner Hyatt & Hickory streets, gauge H.

"At hydrant, corner Hyatt & Hickory streets, gauge I.

"The streams were started a few moments before direct pressure was called for, one side of the siamesed line from the northerly hydrant being closed, the stream from that hydrant being carried for a time through a single line of hose 300 feet long. During the test sometimes one stream and sometimes both were used, at times with $1\frac{1}{8}''$ and at other times $1\frac{1}{4}''$ smooth nozzles. Near the close of the test the hose lines from both hydrants were siamesed together, using a 1" nozzle. There was some wind blowing throughout the test, varying between velocity limits estimated at about five and perhaps fifteen miles per hour. At times the streams were greatly affected by wind, their solidity being destroyed at comparatively short distances above the nozzles. It is possible to get one good fire stream effective in the upper floor of the building from the existing main. The simultaneous use of a second stream materially reduces the effectiveness of the first.

"By way of explaining a part of the differences between simultaneous pressure readings at the several points, it is explained that the elevations of the gauges varied considerably, as indicated by the following elevations of tops of hydrants above city datum, the figures having been obtained from the city engineer:

Top of hydrant in front of pumping station,	elevation......	94.68 ft.
" " " at corner 4th & Bluff streets	"	110.98 "
" " " S. of " Hickory & Hyatt Sts.	"	135.01 "
" " " at " " " " "	"	139.59 "

"Between the pumping station and the Hyatt street hydrant there would be a difference of hydrostatic pressure of 19.4 lbs. The friction losses in the mains depend on the velocity of flow and increase in greater ratio than the flow. The pressure charts show a maximum difference between the plant and northerly hydrant of about 53 lbs., which occurred at 10:02 a. m., when both $1\frac{1}{8}''$ fire streams were running, throwing water at a combined rate roughly estimated at 450 gallons per minute. The simultaneous difference between pressures recorded at the hydrants at corners of 4th & Bluff streets and Hyatt & Hickory streets (about 1900 feet apart on the 6" main) was 42 lbs. The static pressure difference between these points is 17 lbs., so that the friction loss in the 6" main alone, occasioned by the domestic consumption and a fire stream demand of 450 gallons per minute additional, is about 25 lbs. This is rather large,—so large that considerable larger flow of water with even as much pressure at delivery end can hardly be expected from the existing mains. Better fire service for the furniture factory referred to herein requires more water-carrying capacity in the mains leading to this locality. The laying of 1,000 feet of main ordered by the council on Walker street, from Caroline street to Sutherland avenue, would close a gap in the system and add another line to supply the furniture factory.

"In regard to the need of better fire protection for the factory, it should be stated that the Janesville fire chief pronounced the existing fire service inadequate, as the size of the factory, the inflammable character of its contents, etc., make it likely that a fire once started therein would rapidly gain headway and assume large proportions, requiring more than one or two good streams to cope with it. We learn that the building and contents are assessed on about $22,000 and the company carries $60,000 of insurance. It has no automatic sprinklers installed, but keeps a few hand fire extinguishers in convenient places. The fire chief stated that a fire alarm box is installed in the building and another at the corner of Hyatt and Hickory streets, about 200 feet from the building. It is believed that the installation of an automatic sprinkler system in the factory would be of considerable value, if kept under sufficient pressure, in quenching, or at least checking, incipient fires in the building, and might reduce the insurance rate thereon.

"It is recommended that a 6″ or larger main be laid on Walker street, connecting the 10″ main on Caroline street with the 6″ main on Walker street at the intersection of Sutherland avenue. There are no buildings fronting on the proposed main except at the corner of Sutherland avenue, where there is now a fire hydrant, so that for the present no fire hydrants are needed on the proposed main. Said main will intersect two streets (Cornelia and Thomas) between its extremities, and these intersections would be appropriate locations for hydrants which will be needed when houses or buildings are erected in this locality. There is a ravine extending southwesterly from near the intersection of Cornelia and Walker streets, and the roadway of Walker street for a short distance is on an embankment across said ravine. The statement was made to the writers by one of the officers of the water company, that it would be necessary for the city to build up and widen out the embankment and allow it to attain its permanent settlement before a main could be safely laid therein. We learn from the city engineer, Mr. C. V. Kerch, that a tentative grade line has been established for Walker street in this vicinity, and were shown by him that the street is nowhere more than about one foot lower than said tentatively established grade. It does not, therefore, appear that the present condition of the street or question of permanent grade need delay the laying of that main."

From the foregoing report it seems clear that adequate protection is not afforded the factory in question, and that the construction of the proposed extension on Walker street will improve the fire protection and bring it more nearly to the point of adequacy.

The next matter to be determined is the cost to the company of putting in the main and furnishing the fire service. The engineering staff estimates the cost of a six-inch main with two hydrants at $820. This brings up the question of what costs, other than the investment in the main, are involved in the proposed extension. The district through which this main passes is well within the fire protection limits of the city. In making the apportionment of expenses upon which the cost of fire protection, as outlined on preceding pages of this decision, was based, the fire demand furnished the basis for apportioning capacity expenses, and was the demand which the station has to meet in order to furnish adequate fire protection within the protection limits. The proposed main does not add materially to the total fire demand which the station has to meet, but is in the nature of an additional fixture to aid in furnishing the adequate protection which was assumed in making up the statement of cost of fire service, much as an additional hydrant upon an existing main does not add to the total fire risk of the protected area, but is merely an aid to the furnishing of adequate protection. In other words, the proposed extension is not such that, if a number were made, the capacity of the plant would have to be increased in order to meet the demand. Aside from the slight leakage through the additional main, the demand upon the station is not increased to an appreciable extent by such an extension, or by a number of such extensions within the present protection limits. This being the case, it would seem that the rate for fire protection on this extension would not include any of the capacity expenses of the utility, as these have already been included in the rate for existing fire protection. The cost to the city, therefore, for fire protection on this proposed extension, should be made up of the amount of interest and depreciation on the extension itself, and the cost to the utility of pumping whatever additional water is required. Practically the only additional pumpage, aside from what water may actually be used in time of fire, will be the amount of leakage. Of course, there is also an added cost of keeping water in the main, even if none is used, but this appears to be very slight and is almost impossible of determination.

Assuming a leakage of 200,000 gallons per year, which is probably somewhat high for a six-inch main of 1,000 feet in length, and an output cost of practically 5¼ cts. per 1,000 gallons, we find the cost of pumping the additional water required to be $10.50 per year. This amount is necessarily only an estimate, as there is no way of determining what the actual leakage will be. In all probability, if the main is carefully and properly laid, it will be less than the estimate used here. An allowance, however, of $10.50 does not appear too high, when we take into consideration the fact that there is some cost involved in merely keeping water in additional mains.

If an allowance of 7 per cent is made upon a value of $820 for interest and depreciation, these items will amount to $57.40 per year, and to $65.60 if figured at 8 per cent. As there are no private consumers along the line of the proposed extension, the entire cost appears to be a legitimate cost of fire protection, and properly chargeable to the city. There may be some question as to the justice of allowing an interest rate of 7 per cent. There seems no reason to believe that this extension would always be without private consumers, although there are none at present. Because of this it may appear unjust to charge the city an amount which will provide for interest at 7 per cent, and to allow the company to charge its regular rates to private consumers who may take water in the future. In cases where it seems reasonable to expect that private users of water will be supplied within a reasonable time, an initiatory rate of 6 per cent would appear to be an adequate return to be provided by the city in return for the increased efficiency of fire protection. The cost of maintenance of the main and the two hydrants apparently will be very small, about $1 per year. According to the reported expenses for street department labor, it appears that this item may be from $5 to $10 per year, but probably not over $5 for a main situated as this one would be. The total cost, then, appears to be about $74, or at the rate of $37 per year for each of the two hydrants recommended by the engineering staff.

The proposed extension on Eastern avenue from McKey boulevard to Center street would be 3,630 feet in length. This would be a branch from an eight-inch main running south on McKey boulevard, which is now the only main south of the river. The proposed main would extend through a district of small houses, generally of low cost. There are nineteen houses fronting on the proposed main. The total assessed valuation of these buildings is $13,640. Several other dwellings more remote from the main would receive fire protection from it. Including all within 1,000 feet of the main, there would be a total of sixty-two houses, with an aggregate assessed valuation of $34,055. These valuation figures should be increased considerably, probably by about 37 per cent to arrive at the investment value. Residents of this part of the city have private wells. Of the nineteen possible domestic users along the line of the proposed main, only one expressed any interest in the proposed extension as a source of supply for household purposes, and there is some doubt as to whether even that one would actually take water from the main. There is a small public school, known as the Jackson school, fronting on Eastern avenue, and the superintendent of schools stated that if the proposed main were put in, water from it would probably be used in the school for drinking purposes only. At present this school, which has sixty-four pupils, is supplied with drinking water from a well, and it is doubtful whether water from the company's mains will be used if charged for at the regular rates.

From these facts it seems that the only purpose of this extension is to furnish fire protection. At the present time there is fire protection only within a working radius of the hydrant at McKey boulevard, which radius includes only a few houses, or of a municipal well which supplies a fire engine, and in the latter district only when the roads are not blocked with snow or otherwise rendered impassable to the heavy engine. This engine is stationed at the corner of McKey boulevard and Eastern avenue, or at the end of the proposed main. It appears that the laying of the main will involve a considerable length of trench in rock near Center street, ending in what is called "stone hill", and the estimated cost of a six-inch main equipped with seven hydrants is $3,700. This main is strongly urged by the fire chief.

There seems to be no doubt that the fire protection furnished this district is inadequate. If the city desires to offer adequate protection to this area, the only interest of the water company in the proposed extension is in securing a fair return upon the additional investment involved and a sum sufficient to cover the additional operating expenses. On the other hand, the city can hardly expect the water company to deliver water under pressure to aid in fire protection unless a reasonable return is allowed. In this case it is very questionable whether a single consumer will be connected along the proposed main. Its only function will be to supply water for fire protection, at least for a considerable period of time, and no revenue from domestic or industrial users can be expected at present. Thus it is clear that the whole burden will necessarily fall upon the city. Near the western end of the proposed main it is possible that some domestic users will be supplied within a few years. There are a number of rather good residences in this section, but none directly on the line of the proposed main. The cost of putting in private wells in the "stone hill" district will probably lead to the use of water from the company's mains. Such consumers, however, are for the present entirely prospective. There are no houses at present which will be supplied, and an extension can hardly be ordered because of what may some time be supplied. In view of these conditions it would seem that if the extension in question is to be made, the charge to the city for fire protection must cover the increased operating expenses and the interest and depreciation on the investment. What the interest rate should be, may be a matter of dispute. Certainly, if the district to be supplied were such that a large growth of business could be anticipated, an initiatory rate of 6 per cent would appear to be high enough. On the other hand, if there will never be any private consumers supplied from the main, it seems that a reasonable rate of interest would be the same as a reasonable rate upon the rest of the property. Although in the present case there appears to be little probability of any of the people now living along the proposed main becoming users of city water, there seems to be some ground for expecting that the main will eventually supply some private consumers. Near the western end of the proposed main there is a district which is being settled, which could easily be supplied from the main. It is only reasonable to suppose that there will be some development of the business in this district and in the "stone hill" area. Owing, however, to the fact that this business is entirely prospective, it does not appear that the interest rate which should be met by the city can be very materially lowered because of it. On the whole, it seems that an allowance of 7 per cent, or a little more, for interest and depreciation will be a just one.

The conditions which determine the proper amount to be paid by the city for fire protection along the line of the proposed main on Eastern avenue, appear to differ, in theory at least, from those determining the rate for the Walker street extension discussed above. In the case of the Eastern avenue extension, a new area is furnished with protection from the mains of the water company.

The total fire risk of the city is increased by the inclusion of additional buildings within the fire protection limits. In making the apportionment of expenses in this case, the total fire demand, as previously stated, was the maximum demand which the station must be prepared to meet in order to furnish adequate protection to the property within the present protection limits. When a new district is included within these limits, the total fire risk and the total demand which the plant must be prepared to meet are increased.

Of course, it is true that a single addition to the protected area may not necessitate increased capacity at the station. Nevertheless, it is undeniable that additions cannot be made indefinitely without making it necessary to increase the station capacity. In this case it would be obviously unfair to charge the entire cost of increased capacity, or the entire increase in capacity expenses, entirely to the addition which finally necessitated the increased capacity. A general readjustment should probably be made at such time as this condition arises. As a matter of theory, the first addition should bear its share just as much as the second, or the third, or the one which finally compels the increase of the capacity of the plant, but there are practical objections to this plan, as pointed out later.

In a case where the extension has not been made, one way of estimating the cost to the utility is to consider that this extension will occasion the same expense as a main already in use, of the same general characteristics. It was found that the cost of fire protection amounts to $51.78 for each hydrant installed at present. This should not be taken to mean that we believe that a charge per hydrant is the proper method of charging for fire protection, but where it has been the practice to set hydrants at uniform distances, such as one hydrant for each 400 feet of main, the amount per hydrant can be used for comparative purposes.

Following this plan, the Eastern avenue extension would have nine hydrants which should yield a total revenue of $466.02. The engineering staff has recommended that only seven hydrants should be installed on this extension. It must be remembered, however, that the cost of fire protection bears very little relation to the number of hydrants. If, in the case under consideration, seven hydrants are sufficient to afford adequate protection to the district along Eastern avenue, the installation of two additional hydrants would affect the cost only by the amount of interest, depreciation, and cost of maintenance of the two hydrants. This would amount to approximately $5 per year, so that the total cost of fire protection along the proposed extension, computed on this basis, will be very nearly $461 per year. This includes interest and depreciation on part of the station investment, which would be correct if investment followed exactly each extension of the protection limits. In practice extensions are seldom made in this manner, as pointed out later.

The difficulty in the way of determining directly the cost of fire protection along this extension is, that it is very difficult to determine what additional station expenses or capacity expenses should be charged to it. Interest and depreciation on the estimated cost of the extension alone, if taken to be 7½ per cent of $3,700, would amount to $277.50 per year. As conditions are at present, it would seem fair to charge the entire amount of interest and depreciation to the fire service. Certainly, this is a cost to the utility which should be met by consumers, and as the city is the only consumer, it seems that this expense should be met by the city.

As stated above, however, the interest and depreciation on the main and hydrants do not constitute the only cost of furnishing water under pressure for fire protection to new and previously unprotected districts. There is a portion of the capacity expenses of the plant which are also properly chargeable, theoretically, to this service. The difficulty, of course, is to determine what these expenses will be.

Probably the most satisfactory method of arriving at this amount will be to pro-rate the pumping station capacity expenses which are chargeable to fire protection among the existing hydrants and assume that the new extension should be charged at about the same rate. The use of the number of hydrants as the basis can be justified because of the fact that they have been installed at uniform distances, at least to a large extent. The pumping station capacity expenses amount to $2,692.70, of which 44 per cent, or $1,184.79, should be charged to the fire service. This amounts to $3.88 per hydrant.

If hydrants were installed upon the proposed extension at 400 foot intervals, or nine hydrants in all, the amount of station capacity expenses chargeable to the extension would be $34.92, exclusive of any allowance for interest and depreciation. The fact that only seven hydrants have been recommended does not lessen this amount, as the demand upon the station is not determined by the number of hydrants. It is not believed that this pro-rating of station capacity expenses according to the number of hydrants, or really according to the length of mains, gives a result which is absolutely correct, because the demand upon the station depends upon the nature of the district to be protected rather than on the length of mains or number of hydrants. It does furnish a guide, however, to the proper amount to be charged to the new extension.

If, in order to illustrate the manner in which a rate would be made if station capacity were actually enlarged with each extension, we assume that the same basis is used with regard to interest and depreciation on the pumping station and on the source of supply, we find that approximately $67 per year is chargeable to the new extension. These items make up a total expense of very nearly $380. This does not include any of the capacity expenses of the distribution system, or any of the general expenses. Probably the only distribution system expense which should be charged to this extension is the cost of maintenance of the main itself and the hydrants, which would amount to about $3 per year, using the reported expenses for these purposes as a basis, and apportioning the proper amount to this extension. Street department labor would apparently amount to about $20 per year, pro-rating this expense in a general way according to the length of mains. This gives us a total of $403, aside from the cost of pumping water to the main and the proper proportion of general expenses. It appears that about $40 should be added to this amount for general expenses, if allowance is to be made for the eventual increase of this item, and probably $20 or more for pumping the water actually required. This gives us a total cost of $463 per year, or very nearly the amount arrived at by the first method of computation as the charge which would be made if the capacity of the station were actually changed with each extension.

Objection may be made to these methods on the ground that a charge for fire protection on this proposed extension, based upon the foregoing method of computation, provides for an interest return upon investment which has not yet taken place. That is, a single extension will probably not necessitate an actual increase in plant investment or in the station capacity. The only added investment actually required at this time is the investment in the main itself and the hydrants placed upon it. It may also be true that general expenses will not actually be increased by the building of a single extension. According to this method of making a rate for fire service, no allowance should be made for interest upon added plant capacity or for general expenses until such added capacity is actually put in or until general expenses are actually increased. This, of course, would necessitate a readjustment of the entire charge for fire protection at such time as actual changes in plant capacity and general expenses are made. It is not believed that the foregoing methods of estimating the cost of increased fire protection can be accepted finally as the proper basis for making a rate at this time. Rather, they represent what the rate would probably be if station capacity and general expenses were to keep pace exactly with the extension of the protection limits. According to the second method of computing the cost of this extension, if interest and depreciation on source of supply, etc., are not included, and no provision is made for increased general expenses, the total cost would be $356 per year.

While in theory each increase in the protected area has its effect upon the demand and so upon the capacity, it may be a long time before an actual, appreciable increase in demand is made and before the station capacity must be increased. It seems to be generally true that increases in capacity do not follow closely the extension of the protection limits. Rather, there are times when the plant capacity is greater than the actual need, and the capacity will not be increased until it has fallen somewhat below the theoretical maximum demand.

While in theory each extension increases the demand upon the station and so affects the required capacity, in practice no attention is given to this until the extensions have been sufficiently numerous to make necessary an actual increase in plant capacity. From this it seems to follow that, while, as a theoretical proposition, each extension should be charged with interest and depreciation on a portion of the station investment, in actual practice the full amounts of such interest and depreciation which are due to the fire service are borne by the existing system. If, then, the rate for the extension, even when it reaches a new district, is made without including any allowance for interest and depreciation on the station, the total charge to the city for fire protection will include the total present cost of these items, and the final result will be just. If it were necessary to apportion the cost of fire service among several consumers, as would be the case if the proposed main were to supply some demand other than that exerted by the city of Janesville, it would be necessary to apportion a proper share of such interest and depreciation to it. In this case, however, the city is the only party demanding fire service of the kind in question, and the important consideration is to have the total charge correct.

It has been found that the city should pay $15,800 per year for fire protection and such small amount of water as is used for sewer flushing. If the proposed main is put in, it might seem that some of the interest and depreciation on the station investment should be charged to it. If the main is not put in, however, these expenses still remain and must be met by the existing system. In order to determine, as a matter of practice, whether or not the main in question should be put in, therefore, it seems best to take into consideration only the actual increased cost to the plant at the present time. If, in the future, enough extensions are made to necessitate an actual increase in plant capacity, a readjustment of the charge for fire protection may be made at that time.

This would indicate that no allowance should be made, in practice, for the theoretical increase of demand and of capacity. The same seems to hold true with regard to the general expenses. This indicates that $356 is very nearly the amount which the company should receive annually if the main is laid on Eastern avenue. The amount of $356, as here given, includes, however, an allowance of about $35 for fixed expenses at the station other than interest and depreciation, which would seem to be subject to the same line of reasoning as the expense of interest and depreciation themselves.

The estimate of $20 per year as the cost of increased pumpage necessitated by the main is probably conservative. There is almost always a certain amount of leakage to be overcome, and the cost of delivering the increased amount of water to the main may be considerably above $20 per year. On the whole, it appears that $325 per year is the proper addition to be made to the amount fixed as the cost of existing fire protection if the proposed main is put in.

It seems that the order of the city relating to these extensions contained no provision regarding the number of hydrants. The franchise under which the water company operated for a number of years provided for a hydrant to be located on each 400 feet of extensions of the distribution system. On Jan. 20, 1910, the Janesville Water Company filed an application for an indeterminate permit, thereby surrendering its franchise. There seems to have been some doubt in the minds of the officials of the company whether the franchise regulation relating to the distance between hydrants would hold under the indeterminate permit, in the absence of an order from the city stating the number of hydrants to be placed upon each extension. There appears to be no reason why hydrants should be placed at 400 foot intervals, except in cases where such distances would result in having them placed at street intersections.

If the proposed extensions are put in, it seems that the recommendations of the engineering staff, calling for two hydrants on Walker street, and for seven on Eastern avenue, should be adopted.

It would seem that all that need be done by the Commission in this matter would be to determine how many hydrants should be placed upon each extension, and what amounts should be added to the charge for existing fire protection because of these extensions. If the city, after being put in possession of these facts, still desires to have these extensions made, the water company should proceed to lay the mains and install hydrants as recommended.

It is realized that the rates as fixed by this decision are tentative in nature. When meters are in general use, it may be that changes in amount of water used and in the operating expenses will make a revision of the rates, as fixed herein, necessary. If this situation arises, the Commission will be ready to make such modifications of this order as appear necessary. Until such facts as will be needed to effect a readjustment become available, we are of the opinion that the following order is reasonable.

It is the duty of the utility to put in meters unless exempted by the Commission. In this case the company has not asked for an exemption. Although no demand for meters has been made in the complaint, the utility should install meters within a reasonable time.

IT IS ORDERED THAT:

1. Meters and services from main to curb line shall hereafter be installed at the expense of the utility.

2. All public buildings shall be metered and charged the regular meter rate.

3. Public fountains shall be charged for at $45 per year each, or metered.

4. Street sprinkling rates shall remain as at present.

5. The charge to the city for fire protection and sewer flushing shall be $15,800 per year.

6. There shall be no charge to private parties for hydrants installed on their premises at their own expense, in any form, except in cases where the premises protected are clearly outside the fire protection limits of the city, in which case the charge shall be based upon the size of service connection, and shall be the same as the present flat rate in use where private fire protection is furnished.

7. Flat rates shall remain as at present, except that the charge for each room in excess of five, in residences, shall be reduced from $0.75 to $0.50 per year, and the charge for water closets and baths in residences shall be reduced from $4 per year to $3 per year.

8. Water used for construction purposes shall be charged for as follows:

Lime or cement, per barrel	$0.02
Stationary steam engines, working not over 10 hours per day, per horse power	3.00
Laying stone, per cord	.05
Laying brick, per thousand	.05
Laying cement sidewalk, per lineal foot	.005
Paving, all kinds, 36 ft. wide, per lineal foot	.01
Sewer work, cement curb and gutter, per lineal foot	.005
Plastering, per 100 square yards	.10

9. Meter rates shall be:

Service charge:

Size of meter.	Quarterly charge.
½ in. and ⅝ in	$1.50
¾ in	2.00
1 in	2.50
1½ in	4.50
2 in	6.00
3 in	12.50
4 in	18.00

Charge for water:

For the first 50,000 gallons used through a meter per quarter, 7½ cts. per 1,000 gallons.

For the next 50,000 gallons per quarter, 5½ cts. per 1,000 gallons.

For all over 100,000 gallons per quarter, 4 cts. per 1,000 gallons.

Where more than one consumer is supplied through a meter, an additional service charge of $1 per quarter shall be made for each additional consumer.

10. Where meters are owned by consumers, the utility shall acquire the meters or pay an annual rental to owners, as follows:

Size of meter.	Annual rental.
½ in. and ⅝ in	$1.50
¾ in	2.60
1 in	3.70
1½ in	6.00
2 in	7.80
3 in	16.20
4 in	19.20

11. The company shall make the extension on St. Mary's avenue, as ordered by the city, putting in a main of not less than two inches in diameter. Sixty days is believed to be a reasonable time within which to comply with this portion of the order.

12. If the city shall make a further order to that effect, the water company shall lay the six-inch main on Walker street, already ordered by the city, and install two hydrants upon it, and the city shall pay $74 per year in addition to the $15,800 to be paid for present fire protection.

13. If the city shall make a further order to that effect, the water company shall lay a six-inch main on Eastern avenue, as already ordered by the city, and install thereon seven fire

hydrants, and the city shall pay for this service $325 per year, in addition to other charges for fire protection.

Ninety days from such time as the city shall make additional order or orders requiring either or both of the latter extensions to be made is deemed a reasonable time within which to make such extensions.

14. Rates as fixed by this decision shall take effect at the beginning of the first quarter following the date of this decision.

TOWN OF WAUWATOSA,
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 17, 1911. Decided Aug. 21, 1911.

Petition praying that respondent be required to restore the highway at the crossing on North avenue, in the town of Wauwatosa, to a condition of usefulness, making such changes in grade, width and drainage, as the public use may require; that obstructions be removed and that a permanent trestle of sufficient width be constructed.

It is ordered: **That the respondent 1. Construct and maintain a bridge in accordance with the plans and specifications submitted.**

2. Reduce the grade to the bridge approaches to not more than 6 per cent and restore the drainage of the highway and adjoining property.

3. Make necessary fillings where the approaches intersect existing highways.

4. Construct a proper passageway from the approach to adjoining school grounds.

The petitioner is a municipal corporation of Milwaukee county, state of Wisconsin. The petition is signed by the town board of supervisors and sets forth that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that said town is very thickly populated and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicle; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension is being constructed and extended in a northerly direction across the westerly end of said town of Wauwatosa, and crosses a highway in said town of Wauwatosa known as North avenue; that said highway is sixty-six feet in width, running east and west through said town of Wauwatosa and is used largely by farmers in carrying produce to the city of Milwaukee and merchandise from said city, and is subjected to much other general traffic; that prior to the time said Chicago & North Western Railway Company started its work on said new extension, there was at the point at which said extension now intersects North avenue, a grade or hill in said highway extending from the west line of a section line road, running between sections 17 and 18 westerly for a distance of 864 feet; that the said town of Wauwatosa had, through years of road work and at large expense to it, improved the highway at this point, in grading and otherwise, and had during such time maintained an average grade upon said hill of 3.15 per cent, and that such grade as maintained by the town of Wauwatosa was necessary to the public use of said highway and the traffic thereon; that said Chicago & North Western Railway Company, in the building of its extension, has cut through North avenue and has changed the grade from 3.15 per cent to a grade of 8 per cent, and making what was an easy hill or grade a steep hill or grade, by reason of which the former condition of usefulness of said highway has been destroyed by making it unserviceable, unsafe and dangerous to team and vehicle traffic and impassable to heavily loaded traffic.

The petition further alleges that the said Chicago & North Western Railway Company has constructed a fence on the north and south side of said North avenue for a distance of 730 feet, leaving a roadway of but twenty-five feet between said fences, thus not only encroaching upon the highway proper and interfering with the free use thereof by the public, but also interfering with the ingress and egress to the property adjoining said highway, and particularly to the grounds of joint school district No. 4; that the said Chicago & North Western Railway Company has constructed on said North avenue, at a point 469 feet west of said section line road, a wooden trestle for the purpose of crossing its roadway and tracks; that said wooden trestle is built in three sections, and that the east portion thereof is built at an 8 per cent grade, and that by reason of the grade the same is dangerous and impassable to teams in slippery and winter weather; that the needs of this highway at this point require a substantial structure of sufficient width so as not to interfere with the traffic, usefulness and the development of said highway in the future; and that the said Chicago & North Western Railway Company, in making said changes upon said highway, did build on the north side of said highway a driveway leading from the roadway proper to adjoining premises, and that in so doing it filled in the natural and artificial drainage or gutter line and made no provision for the taking care of the drainage of water. Wherefore, petitioner prays that said Chicago & North Western Railway Company be required to restore said highway at the places herein complained of to a condition of usefulness, making such changes in grade, width and drainage as the public use thereof may require; that the said Chicago & North Western Railway Company be required to remove the encroachment and obstructions placed by it upon said North avenue, particularly with reference to the fences, and that it be required to construct a trestle across its said tracks of a permanent nature and of sufficient width to meet the needs of the public and traffic upon said highway; and for such other and further relief as this Commission may determine.

Respondent, in answering the complaint, alleges that it is its intention to have what is known as North avenue, where it crosses the tracks of the Chicago & North Western Railway Company, put in first class condition and to make it in every way satisfactory.

The hearing was held on Feb. 17, 1911, in the town hall in the city of Wauwatosa. *G. J. Davelaar* appeared for the petitioner and *W. G. Wheeler* for the respondent.

The testimony shows that the Chicago & North Western Railway crosses North avenue in the northeast quarter of section 19 and the southwest quarter of section 18 at a point about 500 feet west of the east section line. The engineer retained by petitioner testified that the average grade of the highway at this point, prior to the time the railway company built its extension, was somewhat greater than 4 per cent, with a maximum grade of 7 per cent; the assistant chief engineer of the railway company stated that the profile submitted by petitioner's engineer showed a maximum grade of 8 per cent to have existed previous to the change made by the railway company. The grade as now established by the company has a maximum of 8 per cent which applies to the greater part of the eastern approach. The original grade or hill was 1,100 feet in length; the present grade has shortened the distance one-half. Not only is the ascent thus made more difficult, but teams at the bottom of the hill are unable to see approaching traffic beyond the bridge, as the view has been narrowed by the change of grade. Several farmers testified to having experienced some difficulty in reaching the top of the old grade, but stated that the present grade made the difficulty much greater and at times impossible of ascent by heavily loaded teams without assistance. Two of the witnesses testified to being compelled to use longer routes to reach their destination by reason of the inability to get over the hill with heavy loads. The traffic on this highway is principally farm produce, manure, coal and lumber. The filling made by the railway company has made a long embankment which at the summit of the hill amounts to about 13 feet high, thus making the ascent hazardous to life and property in the case of heavy farm wagons attempting to pass a load of hay, or even of ordinary vehicles with restive horses, the width between the fences being twenty-five feet. Witnesses testified that it is not possible for two loads of hay to pass on such a narrow highway.

The testimony shows that the approaches of the wooden trestle, or bridge, have a like width of twenty-five feet, and that the trestle itself is twenty-one feet wide between the fences. Opinions of the witnesses differ as to the required width of the roadway for safe and convenient travel, some stated that thirty feet would be sufficient, while petitioner's engineer claimed that forty feet should be allowed. The company's assistant chief engineer testified that a mistake had been made by the engineer in charge of the construction in placing the fences twenty-five feet apart, as the company's plans provide for a width of thirty-two feet on the approaches. He further stated that the crossing was a temporary structure, as the necessary material could not be obtained in time to construct the bridge as planned. He produced plans of the proposed structure and described the bridge, when completed, as having steel girders about forty-one or forty-two feet long and protected by an iron hand railing on top. The bridge will have a width of twenty-four feet between hubguards or wheelguards. Petitioner's witnesses testified that the change of grade interferes with the natural drainage at a certain driveway leading from the approach to land owned by a Mr. Mouer, and also at the intersection of North avenue with the section line road at the foot of the hill where district school No. 4 is situated. At the latter point the filling covers the culverts, thus causing the water to flood the school grounds in rainy weather. Officials of the school district and other witnesses stated that, whereas there was formerly free egress and ingress for the school children, the raising of the highway and its being fenced in now deprives them of an entrance from North avenue; they urged the importance and necessity of a passageway at the southwest corner of the school property, as it is now necessary for the school children living west of the approach to travel 500 or 600 feet farther than before the change of grade. The company's engineer expressed a willingness to provide such egress and ingress as was necessary.

Subsequent to the hearing two inspections of the crossing were made by members of the engineering staff of the Commission, who report that the east approach is difficult of ascent by heavily loaded teams and recommend the construction of a 6 per cent grade in lieu of the present 8 per cent. This change necessitates carrying the approach a considerable distance east of the north and south highway, known as the section line road, making necessary the raising of the highway at the point of intersection and filling in the adjoining property in the southeast angle of such intersection to a level with the new approach. It does not appear that it will be necessary to raise any of the buildings, as they now stand somewhat higher than the present roadways. This arrangement, we understand, meets with the approval of the property owner. The report states that at the present time the drainage conditions at the corner of North avenue and the section line road are the same as existed prior to the construction work. No reference is made in the report to the obstruction caused by the driveway to Mr. Mouer's land; however, we suggest that a pipe be laid under this roadway as an outlet for the water above. The report recommends that a passageway be provided from the approach to the school grounds.

It is believed that the construction of the bridge as planned will be sufficient for traffic which may reasonably be expected over this crossing for some time to come. It is understood that the railway company will move the fences of the filled approaches, thus giving a roadway width of thirty-two feet between railings.

Now, Therefore, it is Ordered, That the respondent, the Chicago & North Western Railway Company, construct and maintain a bridge at the intersection of its Milwaukee-Sparta extension with North avenue in the town of Wauwatosa as per plans and specifications submitted to this Commission.

It is Further Ordered, That said railway company so grade and maintain the approaches or those portions of the highways of which said bridge forms a part which cross the right of way of the said railway company, so that same shall not exceed a grade of 6 per cent at any point, that the same may be as safe and convenient for public travel as they were prior to the raising of said portions of the highways, and preserve the natural and artificial drainage of the highways and adjoining property.

It is Further Ordered, That said railway company fill in the adjoining property in the southeast angle of the intersection of North avenue and the north and south highway, known as the section line road, to a level with the new approach.

It is Further Ordered, That said railway company provide a passageway from the approach on North avenue to the school grounds at the southwest corner of the school property and that same shall be constructed and maintained with due regard to the safety and accommodation of the public.

Four months is deemed a reasonable time within which to comply with these orders.

CITY OF GREEN BAY
vs.
GREEN BAY TRACTION COMPANY.

Decided Aug. 21, 1911.

This case involves the question of whether or not the petitioner can compel the respondent to fulfill the agreement of its predecessor to build and operate additional street railway trackage. The agreement was that such predecessor should remove certain trackage in the west side of said city and within a specified time build and operate an equal amount of trackage in the same section. An application was made to the common council for authority to construct a portion of such trackage. No action was taken by the council until several years later, after the expiration of the time specified and after such company had transferred its property to the respondent and had dissolved.

Held: **That the refusal of the common council to act within a reasonable time was tantamount to a denial of the application; that such application was for an independent franchise; that at the time the respondent acquired the property no right was transferred to construct such line; that the attempted grant by the council was nugatory as the grantee was then no longer in existence; that the respondent was not a party, either direct or indirect, to the transaction and is therefore in no wise bound to perform the obligation attempted to be created. Petition dismissed.**

The petitioner alleges that prior to the organization of the Green Bay Traction Company the present street railway system in the city of Green Bay was owned and operated by the Fox River Electric Railway & Power Company; that during the year 1899 said railway and power company entered into an agreement with the city, wherein and whereby it was agreed and provided that the said company should be allowed to take up its tracks on Kellogg street from Broadway to Oakland avenue, on Oakland avenue from Kellogg street to Shawano avenue, on Third street from Broadway to Oakland avenue, and on Oakland avenue from Third street to Fifth street; that within three years from Sep. 22, 1899, the said company should replace, build, equip and operate within the residence portion of the west side of the city an amount of track equal to that so taken up; that, pursuant to said agreement and of the terms of an ordinance passed by said city permitting the taking up of said track, the said railway company took up and ceased to operate its railway in the streets above described; that during the year 1904 said company, for the purpose of partially carrying out the said agreement for the construction and operation of additional street railway trackage, made application to the common council of the city for a franchise for the construction of a line of street railway on Dousman street, from Broadway to Gray street in said city; that on Dec. 3, 1909, the common council enacted a franchise authorizing said company to construct such line of street railway on said Dousman street in said city, as requested by said company, and said franchise was duly approved by the mayor of said city and published in the official newspaper of said city, so that the same became a valid and binding ordinance; that on June 1, 1905, the respondent, the Green Bay Traction Company, was organized as the successor of the Fox River Electric Railway & Power Company and became the owner of the franchise under which the said street railway system was operated in said city, and succeeded to all the rights, duties and liabilities of the said Fox River Electric Railway & Power Company insofar as the same related to the said street railway system within said city, and the Fox River Electric Railway & Power Company was dissolved, surrendered its charter or articles of incorporation, and has not been in existence since 1905; that after the passage of the ordinance above described, on Dec. 3, 1909, the respondent was duly notified of the passage of said ordinance, and has been repeatedly requested by said city to construct such line of street railway; that the respondent and its said predecessor have entirely failed to construct such line of street railway on said Dousman street or on any part of the same, and have entirely failed to construct any street railway track pursuant to said agreement; that the city of Green Bay is a populous, thriving city with over 25,000 inhabitants, and that more than one-third of the population of said city resides on the west side of the Fox river; that said city and the inhabitants thereof residing on the west side of the Fox river have no adequate street railway service or facilities; that there is only a single line of street railway now existing and operated on said west side of the Fox river, which line is so located as to serve very few of the inhabitants residing on the west side of the city, and is used very largely for interurban railway purposes; that there are approximately 6,000 people residing on the west side of the city who are unable to obtain street railway service within a reasonable distance of their homes; that the said Dousman street is located in a portion of the west side of the city which is thickly populated, and the people living on said street and for a great distance on either side of said street are unable to obtain street railway service; that it is necessary that a line of street railway be constructed upon said Dousman street connecting with the tracks of the respondent company at Broadway, and extending on said Dousman street to Gray street; that the population residing on Dousman street and on each side thereof and tributary thereto are of sufficient number so that said line of street railway on said street could be operated and maintained in connection with the respondent's street railway system at a reasonable profit; and that a reasonably adequate street railway service in the city requires the construction and operation of said line on Dousman street as above described. Wherefore, petitioner prays that the respondent company be required to carry out the terms of the agreement to construct, build, equip and operate a line of street railway on Dousman street, from Broadway to Gray street, within such time as the Commission may deem necessary and proper.

The respondent answering the petition herein alleges:

That that part of the city of Green Bay lying on the west side of Fox river prior to 1895 constituted the city of Fort Howard; that in 1895 said city of Fort Howard became, by annexation, a part of the city of Green Bay; that said city of Fort Howard, in 1892 or thereabouts, had granted to one David McCartney, a resident of said city of Fort Howard, a street railroad franchise authorizing the operation by McCartney of a street railway on Broadway and certain other streets in said city of Fort Howard; that thereafter the physical property, exclusive of franchises, agreements, etc. of the so-called McCartney lines, were sold to the said Fox River Electric Railway & Power Company, and by consent of said city of Green Bay the McCartney franchises were surrendered and canceled, and thereupon the said Fox River Electric Railway & Power Company applied to the common council of the city of Green Bay for, and was granted, an extension of its franchises and rights previously existing in said city upon the east side of Fox river, upon the easterly end of Dousman street, and upon Broadway from the intersection of Kellogg street south to the city limits, on the west side of Fox river, in said city, with leave from said city to take up the tracks previously laid by the said McCartney on Kellogg and certain other streets, as to which last named streets the said Fox River Electric Railway & Power Company was not authorized or obligated to operate its said railway; that, as a part of said ordinance, the said common council of said city injected the requirement that the said company should restore such streets on which the tracks were so taken up to as good condition as the adjacent portions of said streets, and also the further requirement that said company "shall within a period of three years from the date of this ordinance replace, build, equip and operate within the residence portion of the west side of the city of Green Bay an equal amount of track to that so taken up", and also a further provision that "any track laid on Mather street in the meantime shall not count as against the track taken up."

That said Fox River Electric Railway & Power Company, under the authority of said franchise as so extended upon the streets on the west side of Fox river, did commence the operation of said railway on the easterly portion of Dousman street and on Broadway from the intersection of Dousman street and Broadway southerly to the city limits, and did take up the tracks, ties, poles, wires, etc., of the previously so-called McCartney lines on Kellogg and certain other streets, such removal of said tracks on the streets referred to being made because it was unprofitable and impossible to properly operate the said railway on said streets, and because such operation would not and did not properly accommodate the public; that thereafter the said city duly extended the three year period for the reconstruction of an amount of track equal to that taken up on said Kellogg and other streets for an additional period of three years; that before the expiration of said period, as so extended, the said Fox River Electric Railway & Power Company, under the authority of the common council of said city, constructed, and in due time operated, an additional line of railway on the west side of Fox river, within the territory formerly included in the city of Fort Howard, as follows: Commencing at the intersection of Broadway and Kellogg streets, then running north on Broadway to Mather street, and thence running west on Mather street to Velp avenue, thence running northerly on Velp avenue to the city limits, and then on to Duck Creek, a small village about five or six miles from the center of the city of Green Bay; that the track so constructed and operated, exclusive of that laid on Mather street, was and is not only equal to, but greater in length than that taken up by said company on Kellogg street and the other streets above referred to; that during the year 1904 the Fox River Electric Railway & Power Company made application to the common council of the city of Green Bay for a franchise authorizing it to construct and operate a line of railway from the intersection of Broadway and Dousman streets in said city westerly on Dousman street to a point about a mile from said starting point; that said common council indefinitely postponed said application and never acted upon the same, except as hereinafter stated; that in December, 1909, more than five years thereafter and without further application by any railway company, the said common council, on its own motion, reconsidered its previous action on said last above named application and passed an alleged ordinance or franchise, authorizing the Green Bay Traction Company to build a line of railway on Dousman street for the distance included in said application made by the Fox River Electric Railway & Power Company in 1904; that the Green Bay Traction Company was organized and purchased the property and franchises of said Fox River Electric Railway & Power Company on June 1, 1905, and since that time has operated and is now operating said railway in the city of Green Bay; that said Green Bay Traction Company never applied for the franchise purporting to have been granted to it by said city of Green Bay, and never accepted the same, nor attempted to construct or operate a line of railway on the portion of said Dousman street included and described in said alleged franchise; that in 1909 said Green Bay Traction Company applied to the common council of said city of Green Bay for a franchise authorizing and permitting said company to construct, operate and maintain a line of railway from the westerly intersection of Washington and Walnut streets in said city, westerly across the bridge over Fox river, commonly known as the Walnut street bridge, which bridge was then about to be rebuilt and since has been rebuilt, and thence westerly on West Walnut street to Shawano avenue, and thence westerly on Shawano avenue to Oneida street; that said application never was acted upon by said common council and was finally withdrawn by said company, because it became apparent that said common council would not act favorably on the same and would not grant any franchise upon or across said Walnut street bridge; that by reason of the above facts the said city of Green Bay is estopped to deny that the conditions of the said franchise to the said Fox River Electric Railway & Power Company extending its franchise upon the west side of Fox River in said city have not been fully complied with.

Further answering the said petition, defendant alleges that this Commission has no power, jurisdiction, or authority to compel a compliance with the conditions of said franchise of 1904, nor the acceptance of such alleged franchise of December, 1909, nor to compel or require the defendant company to extend its lines of railway upon Dousman street or any other street in said city.

Further answering said petition, defendant admits and alleges that the city of Green Bay is a populous, thriving city of over 25,000 inhabitants, and that approximately one-third thereof live upon the west side of Fox river; that said portion of said city is served by street railway lines on the easterly end of Dousman street and thence southerly on Broadway to the city limits, and from the intersection of Dousman and Broadway streets northerly out Mather street and Velp avenue to the city limits and beyond, and that such service is adequate for the present needs of that portion of said city lying upon the west side of Fox river; that the proposed Dousman street extension does not serve any considerable number of people, does not lead anywhere or go anywhere from the standpoint either of the company or of the public; that the same, if built and operated, could not and would not earn an adequate return on the necessary investment, and could and would be only an expense and detriment to the company and a drag on and detriment to the balance of the service of said company in said city.

Further answering said petition, defendant alleges that many of the property owners along said Dousman street do not favor or want the said line of railway to be built and operated on said street in front of their property, and have threatened to enjoin the construction and operation thereof if attempted; that said street, except along the first block west of Broadway, is a residence street; that aside from said first block west of Broadway the first five or six blocks westerly of Broadway are occupied and used for residence purposes, and that within such compass there are many handsome and expensive homes with large and well kept grounds and yards; but that beyond the district comprised within the first five or six blocks west of Broadway the houses along said street are scattered and of only moderate value, and that the real estate along that portion of the street is used by the owners thereof largely for garden and other similar purposes; that on the westerly end of said street the abutting property is used wholly for garden and farm purposes.

Further answering said petition, defendant alleges that the residents of that portion of said city lying on the west side of Fox river are not agreed as to whether they want or need an additional line of railway in that portion of the city or not, and if so, whether the same should be built and operated on Dousman street or on West Walnut street and Shawano avenue, or on some other street, and that by reason thereof there is no concerted need or demand for such extension. That this proceeding, as petitioner believes, was instituted solely for political and private reasons rather than because of any public necessity and demand for such extension of said railway.

The petitioner appeared by *T. P. Silverwood,* its city attorney. The respondent appeared by *Greene, Fairchild, North & Parker,* its attorneys.

In advance of any inquiry into the merits of the petition, counsel for the city and the traction company, respectively, have presented for resolution the question whether the Commission is vested with power to compel the respondent to extend its lines in the manner demanded by the city upon the statement of facts disclosed in the answer and conceded to be correct.

As appears from the pleadings, the respondent is the successor of the Fox River Electric Railway Company and is the owner of all the property, rights, and franchises of said company. The franchise under which the respondent is operating and which is acquired from its predecessor, provides that the grantee "shall within a period of three years from the date of this ordinance replace, build, equip, and operate within the residence portion of the west side of the city of Green Bay an equal amount of track to that so taken up'' by the company in accordance with the terms of such ordinance.

About five years after the passage of this ordinance, and in 1904, the railway company applied to the common council for a franchise authorizing it to construct a line of street railway on Dousman street, from Broadway to Gray street. No action was taken by the council upon this application until Dec. 3, 1909, when an ordinance was passed granting to the applicant the franchise asked for in the application. In the meantime the applicant railway company had passed out of existence. The respondent, as its successor, refused to accept the franchise or to be bound by its terms.

The contention of the city in this proceeding is that the application for a franchise authorizing the railway and power company to construct a line of street railway on Dousman street was made pursuant to the provisions contained in the original ordinance and for the purpose of carrying out, in part, the alleged agreement therein contained respecting the construction of new lines in place of those taken up. If such were the intention of the applicant company, which seems doubtful, as the application was presented to the council almost two years after the time limit provided in the ordinance within which the new line should be constructed had expired, it evidently did not meet the approval of the council, for no action was taken in the matter for upwards of five years thereafter. Under the circumstances, the refusal or neglect of the council to act within a reasonable time was tantamount to a denial of the application. The company afterwards abandoned the project, disposed of its existing lines and franchises to the respondent, and dissolved.

Unless the provision contained in the ordinance relating to the taking up of old lines and the construction of new lines in place of those taken up can be construed as granting to the company the right to construct the new lines in any of the streets in the residence portion of the west side of the city which it might select and in such manner as it might deem to its best interest, it must be held to be a mere agreement between the parties to enter into a contract in the future respecting the location and construction of such lines. That future negotiations in the premises were contemplated when the ordinance was passed, seems to be the construction placed upon it by the city in urging that the application by the company for the privilege in question and the subsequent grant thereof by the council were steps taken pursuant to, and in fulfillment of, the provision of such ordinance as to new lines. Conceding this view as correct, the objection of the respondent to the validity of such provision, because of indefiniteness, is fatal to the contention of the city in this proceeding. It is elementary that the agreement to enter into a contract at some future time in order to be legally effective must be definite in all its terms and leave nothing for determination to future negotiations. It must be certain in its provisions or capable of being rendered certain upon the happening of events which are not the result of future negotiations. The rule is clearly stated in *Shepard v. Carpenter,* 54 Minn. 153, as follows:

> "A contract between two persons upon a valid consideration, that they will, at some specified time in the future, at the election of one of them, enter into a particular contract, specifying its terms, is undoubtedly binding, and upon a breach thereof the party having the election or option may recover as damages what such particular contract, to be entered into, would have been worth to him, if made. But an agreement that they will in the future make such contract as they may then agree upon amounts to nothing. An agreement to enter into negotiations, and agree upon the terms of a contract, if they can, cannot be made the basis of a cause of action. There would be no way by which the court could determine what sort of a contract the negotiations would result in; no rule by which the court could ascertain whether any, or, if so, what damages might follow a refusal to enter into such future contract. So, to be enforceable, a contract to enter into a future contract must specify all its material and essential terms, and leave none to be agreed upon as the result of future negotiations." To the same effect see: *St. Louis Railway Co. v. Gorman,* 100 Pac. Rep., 647; *Wills v. Carpenter,* 75 Maryland, 80; 1 Page on Contracts, secs. 26, 27, 28; 1 Beech on Contracts, secs. 75, 76, 77.

The ordinance here under consideration is not parallel with that discussed in *Thurston v. Huston,* 123 Iowa, 157, 98 N. W. Rep. 637, 639. In that case the ordinance provided that the company might "enter upon and construct, maintain, and operate a single or double track railway * * * upon such streets and highways in said city as may be hereafter designated by the Thomson-Huston Electric Company, in the written acceptance of this ordinance, to be given as hereinafter provided and upon such other streets and public places as said council may from time to time by resolution designate." Several years after the passage of the ordinance the company applied to the council for leave to extend one of its lines. The council passed a resolution granting the request. A property owner on the street in which the line was to be extended brought an action to enjoin the mayor and recorder from signing the resolution. The court said:

"The future growth and expansion of the system was provided for in the clause, 'and in such other streets and public places as said council may from time to time by resolution designate.' Unless this provision for the future was void for uncertainty, or as being in excess of the power vested in the city, then the resolution permitting the use of Third avenue by the railway company was a lawful exercise of the discretion vested in the city council, and the injunction should have been dissolved. We see no occasion to question the grant on the ground of uncertainty. If the construction of an ordinary railway is contemplated between two designated terminal stations, the route to be occupied may perhaps be designated with reasonable certainty in its charter, but a street railway system intended for the use and convenience of a growing city for a long period of years presents a different problem. Of necessity, it must be a growth—a development—and the direction or number of the lines or tracks which will be required in the future cannot be foretold with any precision. New streets will be opened, new additions to the city will be laid out, and other changes not now anticipated will take place. To meet these contingencies, the city council, in granting a charter for a comprehensive street railway system, must either in sweeping terms grant the right to occupy all streets now or hereafter opened, or it must adopt some such expedient as was made use of in this case, and provide for the extension of lines from time to time as the need therefor may arise, and the city council direct. These provisions are not for the granting of new privileges or franchises, but for the reasonable regulation and control of the company in the use of the franchise originally granted. To adopt the other plan, and grant a franchise expressly allowing the company to enter upon and occupy any or all streets, without any power of veto or regulation by the city council, even if of any validity, would be a most unwise and impolitic abondoment of an important right. * * * If, then, as we conclude, the consent of the council for the extension of the company's track into Third avenue is not the granting of a new franchise, but is simply an exercise of the reserved power to regulate the company's use of the city's streets under the original grant, then the provisions of Code, secs. 955, 956, upon which appellee relies, are not applicable, and that part of his argument, based upon said statute requires no further consideration. That statute, by its express terms, is made applicable only to the granting of an original franchise, or to a renewal or extenison of the period for which a grant has been made, and not to mere extensions or enlargements of the facilities which the franchise holder employs in exercising the power originally granted. It is to be conceded that a franchise for a street railway may be confined to any one or more streets or neighborhoods of a city, and if the terms of the grant, when fairly construed, indicate that such restricted or localized privilege was intended, then, of course, any extension of such railway into other streets or districts is subject to all the conditions pertaining to the grant of a new or independent franchise. It is a matter of common observation, however, that, outside of the very large cities, street railway franchises confined to a few streets or districts of the municipal territory are very rare; and, while exclusive franchises, except for limited periods, are not allowable, there can be found very few investors disposed to undertake the construction and operation of a street railway system in our small cities, if the right to expand its lines to accommodate the growth and expansion of the city is denied, or if each successive extension of its track into another street involves the procurement of a new and additional franchise.''

In the instant case respondent's predecessor applied to the council for a franchise authorizing it to construct the line in question and the ordinance passed by the council in pursuance of such application purports to grant an independent franchise. It in no way refers to the previous grant of which it is now claimed to be a mere extension. This ordinance must stand or fall as a separate grant and as wholly unrelated to the original franchise. It cannot be sustained on the grounds which supported the resolution considered in the Iowa case. At the time the respondent succeeded to the property, rights and franchises of the railway and power company, the latter had absolutely no right to construct such line. The application at the time was at most but an offer on the part of the applicant to construct a certain line if authority were granted therefor. This offer was not accepted by the council and, hence, no contractual relation respecting the matter was formed. When it disposed of its property, rights and franchise to the respondent, the railway and power company had no right in the premises which it did or could convey to the respondent. The subsequent attempted grant by the council was nugatory, as the grantee was then no longer in existence. Furthermore, the respondent was not a party, either directly or indirectly, to the transaction and is therefore in nowise bound to perform the obligations attempted to be created by the second ordinance.

The conclusion reached renders it unnecessary to consider other objections which are interposed to the validity of the alleged grant in controversy.

Now, THEREFORE, IT IS ORDERED, That the petition herein be and the same is hereby dismissed.

CITY OF STURGEON BAY
vs.
STURGEON BAY BRIDGE COMPANY.

Submitted June 21, 1911. Decided Aug. 23, 1911.

Petition alleging that the respondent operates a toll bridge over Sturgeon Bay and praying that it be compelled to charge reasonable rates and place the bridge in good repair for the safety and convenience of the public. The charter of the respondent is for twenty-five years and expires within a short time, and the bridge will be turned over to the public. The rates in effect at the time of decision are satisfactory with the exception of the automobile rate.

It is ordered: That the respondent, within forty-five days, make the repairs on its bridge as herein set forth and reduce its rates for automobiles.

The petititioner is a municipal corporation located in Door county, Wis. The petition states that the respondent is a corporation existing by virtue of the laws of this state with its principal office at Sturgeon Bay; that on Nov. 2, 1886, the respondent was granted a charter for twenty-five years by Door county to erect and maintain a toll bridge across the waters of Sturgeon Bay and to collect the following tolls for passage over said bridge during the life of the charter:

For a team of two horses or oxen and one driver	25	cts.
For one horse, conveyance and driver	20	"
For one horse and rider	15	"
For loose cattle and horses per head	10	"
For sheep or hogs per head	5	"
For foot passengers each	5	"
For threshing machine power and not more than six horses	75	"

That for a period of twenty-four years the respondent collected the foregoing tolls for passage over said bridge and return; that on May 2, 1911, the respondent increased the rates to the full amount of toll specified in the charter, that is, the said respondent is collecting and receiving double the amount of toll that it has collected and received for the period of upward of twenty-four years, and that said toll is unreasonable; that for a period of upward of five years said respondent has failed to properly repair and keep up its bridge across the waters of Sturgeon Bay, so that the same has greatly depreciated and is so decayed and ruined as to be wholly insufficient and unsafe for passage; that respondent has repeatedly been petitioned by the city of Sturgeon Bay and the county of Door to make the proper repairs on its bridge; that it has repeatedly refused and neglected to do so, stating as its reason that on Nov. 2, 1911, the said bridge would pass to the public; that on May 2, 1911, the respondent filed with the committee on state affairs of the assembly of the state of Wisconsin a verified statement showing that it has made large profits from the operation of said bridge by charging half the toll provided for in its charter. Wherefore, petitioner prays that an order be made requiring said respondent company to lower the rates to be paid for passage over said bridge, and to place said bridge in good repair for the safety and convenience of the public.

The hearing was held on June 21, 1911, at the city hall in the city of Sturgeon Bay. *Henry Graass* and *William E. Wagener* appeared for the petitioner; respondent was represented by *Carl E. Dreutzer.*

As the respondent had filed no answer to the complaint previous to the hearing, its reply was dictated into the record by respondent's counsel. The answer sets forth that it admits the petitioner is a muncipal corporation as stated, the respondent is a corporation existing under and by virtue of the laws of the state of Wisconsin; that on Nov. 2, 1886, it was granted a charter by the county of Door to erect and maintain across the waters of Sturgeon Bay for the period of twenty-five years a toll bridge; that it was authorized to collect the tolls set forth in the complaint for passage over said bridge; that for a period of upward of twenty-four years it collected the tolls before mentioned for passage over said bridge and return; that on May 2, 1911, it increased the rates to the full amount of its charter, but denies that said rates, as increased, were unreasonable or excessive; that said rates as increased were maintained for a period of but three days, at which time they were lowered to the rate which prevailed from 1886 to May 2, 1911; that said rates were increased because of the request by the petitioner to the Wisconsin state legislature for the passage of a bill which, if passed, would allow petitioner to collect for its own use and benefit tolls which would be the same as the full amount specified in respondent's charter; that it denies that for a period of upward of five years it has repeatedly been petitioned by the city and county board to make repairs on its bridge, but alleges that about the time this complaint was filed with the Commission it was served with a notice by the city clerk of Sturgeon Bay demanding that said bridge be repaired; that from the time the bridge was built across Sturgeon Bay it has at all times kept the same in necessary and proper repair for use as a foot and wagon bridge, as it was required to do under its charter, and, at the present time, is maintaining and keeping the same in repair in accordance with the condition of its charter; that, except as herein expressly admitted, it denies each and every allegation of petitioner's complaint. Wherefore, respondent prays that the petition be dismissed.

According to the testimony the rates of toll charged from 1886 up to the present time have been one-half the rate provided by the charter, except in the early part of 1911, when for four days they were raised to the full charter allowance and also for four days soon after the present ferry started to carry foot passengers, when the toll bridge rate for foot passengers was made 1 ct. each way.

About three years ago the rate for automobiles was arbitrarily fixed at 50 cts. for the round trip. The reasonableness of this charge was disputed by the petitioner. As to the other rates charged, petitioner's counsel stated that the present toll charges are satisfactory.

Petitioner introduced a certified copy of the report of the committee on charters and corporations of the county board, dated May 8, 1911, setting forth that said committee examined the bridge on that date and found it in a very dilapidated condition and sadly in need of repair, and they recommended that the respondent company be made to put the same in repair or be held liable to the county under the bond given to keep the bridge in a good and passable condition. The chief witness for respondent testified that no complaint was made to him by the county board or anyone else before this complaint was filed.

The city engaged an experienced bridge builder to examine the bridge. He testified that the west approach was in very poor condition, its strength and value as to service being about 15 per cent of a new structure. Many of the piles and bents were out of plumb—in one case about two feet; some bents and stringers had no support; several caps and some piles were rotten. These defects had made the structure very weak and unsafe, and snakelike in appearance. Such repairs as have been made, the witness claimed, were with poor material and done badly. He stated that he would not take the risk of going over the bridge with a heavy load. The railing was likewise very weak and was easily shaken; it would not hold up if a horse pushed against it. A ship builder supported all the facts presented by the bridge builder and added that the bridge was not necessarily safe because it carried a weight of five tons. He declared that the bridge was unsafe and that about 160 feet was ready to fall over, and that if it was opened up on one end it would fall over. The west approach of the structure was out of line up and down about 20 inches and sidewise about 2½ feet.

Several teamsters stated that the bridge was in an unsafe condition for heavy loads; that the structure shook when going over it. Some of these witnesses declared that they would not cross the bridge with very heavy loads, as they regarded such an undertaking to be accompanied with great risk to human life. Two teamsters testified that their wagons had broken the planks on the bridge, and another that his horse stepped through a plank when walking over. Other witnesses testified to the unsafe condition of the west approach and to the swaying of the structure when crossing over it with heavy loads.

The secretary and treasurer of the company, who was the chief witness for respondent, and who had been in charge of the bridge for twenty-four years, testified that the bridge had swayed from the time it was built and that it was caused by the length of the piles which supported the structure and which were embedded in soft mud. The piles were forty-two feet long and were ten feet above water, fourteen feet in the water, about eleven feet in soft mud, and the bottom in hard pan. He claimed that the bents were put out of position by ice shoves every winter. Repairs had been made to the substructure and to the decking every year whenever necessary, and the material used was not cull timber or planks, but was as good as could be obtained and was mostly new. His weigher informed him that his own teams, loaded with stone, passed over the bridge carrying a total weight of over five tons each. He believed that the structure would support as much now as when it was built and considered that it was perfectly safe for foot and wagon traffic. Other witnesses for the respondent testified to the swaying of the bridge and also as to its safe condition. The carpenter employed at the bridge stated that the structure swayed on the day it was first opened to the public. He admitted on cross-examination that it should be rebuilt after the charter ran out. The same witness testified that the railing could be shaken with the hand and that it would not withstand the pressure of a horse. He stated that most of the timber and planking that was used was new material.

From an examination of the documents introduced at the hearing, it appears that the first bridge erected under the charter was in 1887 and that it cost $13,677,09, including the superintendent's salary of $1,000. On April 19, 1894, the bridge company entered into a contract with the Ahnapee & Western Railway Company, whereby the latter company was granted the right to construct and operate its railroad along and across a part of said toll bridge for a period of 999 years, in consideration whereof it agreed to pay the bridge company $150 at the end of each and every year during which said railroad is operated across and along such part of said toll bridge. The railroad company agreed, at its own expense, to "reconstruct such new draw in said toll bridge and such parts of said toll bridge on each side of said draw as shall be necessary for its railroad across and along said draw and parts in such manner as shall be approved by the secretary of war and as will not substantially interfere with the use of said toll bridge for public use and travel." The bridge company agreed to keep said reconstructed draw and parts planked for public use and travel and each party covenanted to pay one-half of the expense of operating the draw and of making all repairs to said draw and parts, except such repairs to said draw and parts caused by the fault and negligence of either party, in which case the party at fault shall bear the entire expense.

At a meeting of the board of supervisors of Door county, held on Nov. 12, 1897, the bridge company's bond was ordered increased from $20,000 to $30,000, for the reason, as stated in the resolution, that "the risks to the public in the use of said toll bridge as a public bridge or thoroughfare have increased." Under date of Nov. 21, 1902, a committee of the board reported to the supervisors that upon examination they "found the wagon bridge defective and unsafe for public travel'' and recommended that the bridge company ''use all possible diligence in keeping said bridge in repair, so as to make said bridge safe for men and teams until the ice is sufficiently strong to admit them to build a new and substantial one, which they agree to have finished by the first of May, 1903.'' The bridge company endorsed the report in the following words: ''We hereby agree with all the requirements of your committee as specified above.''

The last complaint of the county board is dated May 8, 1911, and is the report of the committee on charters and incorporations, as hereinbefore mentioned. On May 10, 1911, the common council of the city of Sturgeon Bay passed a resolution setting forth that the bridge in question is wholly within the limits of the city of Sturgeon Bay and declaring that the chief of the Sturgeon Bay fire department had reported to said council that it is unsafe for the fire apparatus of the city of Sturgeon Bay to cross said bridge, and that said bridge is sadly in need of repair and no longer safe for traffic to cross the same. Said resolution instructed the city attorney to bring complaint against the bridge company before this Commission in behalf of the city of Sturgeon Bay.

Respondent submitted eighteen financial statements of the bridge company, showing the operating expenses and revenues from March 30, 1891, to Jan. 28, 1911. These statements cover a period of nineteen years and eleven months, some of them including more than one year's operation, which has necessitated the analysis of revenue being computed on a periodical statement basis instead of an annual basis. This method of accounting is doubtless due to the part time operation of the utility, the bridge being free in winter when ice covers the bay. . The following table gives a percentage analysis of the revenues and expenses of the company.

TABLE I.

PERCENTAGE ANALYSIS OF REVENUES.

March 30, 1891, to January 28, 1911.

Periodical statements.	Ordinary operating expenses and taxes.	Per cent of revenues.	Net income paid as dividends.	Per cent of revenues.	Revenues.	Per cent.
1	$2,342 48	51.18	$2,233 91	48.82	$4.576 39	100
2	2,968 41	63.14	1,733 53	36.86	4,701 94	100
3	2,316 20	52.90	2,062 68	47.10	4,378 88	100
4	4,631 27	93.10	343 20	6.90	4,974 47	100
5	2,946 25	56.70	2,249 23	43.30	5,195 48	100
6	3,710 08	65.13	1,987 35	34.87	5,697 43	100
7	3,385 97	62.92	1,994 40	37.08	5,380 37	100
8	3,666 64	63.28	2,127 41	36.72	5,794 05	100
9	5,037 16	66.44	2,544 77	33.56	7,581 93	100
10	5,329 06	97.42	126 84	2.58	5,455 90	100
11	3,751 21	48.02	4,061 33	51.98	7,812 54	100
12	3,525 64	48.48	3,746 56	51.52	7,272 20	100
13	4,390 66	56.18	3.415 81	43.82	7,796 47	100
14	2,365 49	39.45	3,632 06	60.55	5,997 55	100
15	5,136 72	88.83	680 40	11.17	5,817 12	100
16	4,881 76	76.50	1,500 00	23.50	6,381 76	100
17	2,894 62	54.34	2,431 60	45.66	5,326 22	100
18	3,904 65	65.20	2,083 66	34.80	5,988 31	100
Total	$67,174 27	63.30	$38,954 74	36.70	$106,129 01	100
Arithmetical average	3,731 90		2,164 15		5.896 05	

It will be noted that the company declared dividends very irregularly. The policy of the company apparently was to pay dividends and salaries at the expense of maintenance until repairs could no longer be neglected. Dividends show an average percentage of 36.70 of the revenues.

The following table separates the operating expenses into salary for superintendence, labor, materials and taxes, and shows the percentage to total ordinary operating expenses.

TABLE II.

PERCENTAGE ANALYSIS OF ORDINARY OPERATING EXPENSES AND TAXES.

For period March 30, 1891, to January 28, 1911.

Periodical statements.	Superintendence.	Per cent of total.	Labor & materials.	Per cent of total.	Ordinary operating expenses.*	Per cent.	Taxes.	Per cent of operating expenses.
1........	$1,000	44 64	$1,240 48	55 36	$2,240 48	100	$102 00	4 55
2........	1,000	34 79	1,874 98	65 21	2,874 98	100	93 43	3 25
3........	1,000	45 85	1,181 41	54 15	2,181 41	100	134 79	6 18
4........	1,000	22 14	3,516 96	77 86	4,516 96	100	114 31	2 53
5........	1,000	37 05	1,699 47	62 95	2,699 47	100	246 78	9 14
6........	1,000	28 67	2,488 18	71 33	3,488 18	100	221 90	6 36
7........	1,000	32 48	2,079 23	67 52	3,079 23	100	306 74	9 96
8........	1,000	29 04	2,444 94	70 96	3,444 94	100	221 70	6 44
9........	1,000	20 69	3,833 26	79 31	4,833 26	100	203 90	4 22
10........	1,000	19 51	4,125 40	80 49	5,125 40	100	203 66	3 97
11........	1,000	28 42	2,519 41	71 58	3,519 41	100	231 80	6 50
12........	1,000	29 82	2,354 10	70 18	3,354 10	100	171 54	5 11
13........	1,000	23 85	3,193 40	76 15	4,193 40	100	187 26	4 46
14........	1,000	42 29	1,365 49	57 71	2,365 49	100	....	....
15........	1,000	20 55	3,868 57	79 45	4,868 57	100	268 15	5 51
16........	1,000	21 78	3,593 50	78 22	4,593 50	100	288 26	6 28
17........	1,000	38 63	1,589 05	61 37	2,589 05	100	305 57	11 80
18........	1,000	27 43	2,646 78	72 57	3,646 78	100	257 87	7 07
Total.....	$18,000	28 30	$45,614 61	71 70	$63,614 61	100	$3,559 66	5 60

* "Operating expenses" exclusive of fixed charge, taxes, but including the bridge fund; 10 per cent of operating expenses, charged from 1 to 10 inclusive omitted from 11 to 15 inclusive. During periods 16, 17 and 18 a lump sum was set aside.

The percentage of superintendence in the above table averages 28.30 for the entire period. It seems that a salary of $1,000 per annum for supervising the repairs to the bridge and inspecting the structure at rare intervals is excessive. Salaries and dividends for the period shown in the above tables have averaged 53.68 per cent of the revenue, or a total amount of $56,954.74, while operating expenses, exclusive of superintendence, have averaged 46.32 per cent, or a total amount of $49,174.27. No evidence was submitted showing the revenues and expenses prior to March 30, 1891, but the above tables indicate that maintenance has been kept at its lowest point since the bridge was erected.

Previous to the hearing the engineering staff of the Commission made a tentative valuation of the bridge and reported its present value $16,819 and the cost of reproduction $45,484. The east approach was estimated to be in 30 per cent condition and the west approach in 80 per cent condition; the draw span and appurtenances are estimated as 32 per cent condition. The staff reported that the bridge had been poorly maintained.

Immediately after the hearing an engineer of the Commission made a thorough inspection of the structure and submitted a detailed report of the existing defects. On July 3 the bridge company wrote the Commission that on the previous day additional piles had been placed under the leaning bents at the spot where one of the petitioner's witnesses deemed the bridge particularly unsafe. The letter was referred to our engineering department with instructions to outline to the bridge company such additional defects as should be remedied. Under date of July 21 our engineer directed the attention of the bridge company to the following requirements:

"1. In addition to the remedy applied by you to bents out of plumb, it is the opinion of the Commission's engineers that longitudinal bracing should be placed between repaired bents and two or three adjoining on either side to prevent recurrence of this defect.

"2. In the opinion of the Commission's inspector, piles in a number of bents are so badly decayed and cut at the water line as to be in danger of being broken by storms and ice. These piles should be cut off just below the water line and framed bents placed thereon to carry the deck.

"3. You have made no mention of any repairs to hand rail. This rail at the time of inspection by members of engineering staff was in an unsafe condition, in need of additional bracing and renailing.

"4. In general, it is the opinion of the Commission's engineering staff that the entire structure should be put in such condition that unreasonable restriction as to speed of traffic over bridge will not be necessary, and that repairs enumerated above are necessary to accomplish this."

Now, Therefore, it is Ordered, That the respondent, the Sturgeon Bay Bridge Company, repair its toll bridge as follows:

All piles which are decayed shall be cut off just below the water line, and framed bents placed upon the piling. All bents out of plumb shall be straightened and longitudinal bracing placed between repaired bents and two or three adjoining bents. Decayed portions of the hand rail shall be replaced and the rail firmly braced. The lower chord of the draw which is bent shall be repaired and the entire steel work shall be cleaned and painted. The entire bridge and its approaches shall be placed in a condition to safely handle a light highway loading, uniformly distributed load 100 lbs. per square foot.

Forty-five days is deemed a reasonable time within which to comply with this order.

IT IS FURTHER ORDERED, That the respondent, the Sturgeon Bay Bridge Company, charge as toll for automobiles over said bridge a rate of 15 cts. each one way and 25 cts. each for round trip. This order as to tolls to take effect at once.

TOWN OF WAUWATOSA
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 18, 1911. Decided Aug. 29, 1911.

Petition alleging that in the construction of an overhead crossing on the South Town Line road, the respondent, in building its abutments, has encroached on the highway, interfered with the natural drainage, and has not provided sufficient headway or sufficient width for the subway.

It is Ordered: **That the respondent depress the highway so as to increase the headway to fifteen feet, and so lengthen the highway that same shall not exceed a 6 per cent grade; that a culvert be constructed to take care of the drainage.**

The petitioner is a municipal corporation of Milwaukee county. The petition is signed by the town board of supervisors and sets forth that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that said town is very thickly populated and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by teams and motor vehicle; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway of said town of Wauwatosa known as the South Town Line road between the town of Greenfield and the town of Wauwatosa; that said South Town Line road is sixty-six feet wide and is one of the thoroughfares or arteries of travel running east and west in said town of Wauwatosa, being the east and west thoroughfare which is most southerly in said town and carries the traffic from the city of Milwaukee and points southwest; that the said Chicago & North Western Railway Company at the point it crosses said highway passes over the same by bridge or viaduct, and that the said railway has partially completed the said bridge or viaduct and placed one of the abutments of said bridge or viaduct within the highway, that is to say, about fifteen feet from the north line of said highway, obstructing and encroaching upon the same; that petitioner is informed that said Chicago & North Western Railway Company intends, when said bridge or viaduct is completed over said highway, that there shall be but thirteen feet overhead room, which said headway is not sufficient, in that said highway at this point is somewhat low and may, as the same is developed, require filling, and would thus in all probability make the overhead bridge or viaduct itself an obstruction upon the highway, in that heavily loaded wagons would be unable to pass thereunder; that the said Chicago & North Western Railway Company in the work of constructing said bridge or viaduct has interfered with the natural and artificial drainage of the said highway at said point, and that said railway company ought to be required to provide such drainage under its said bridge or viaduct as would restore said highway to its former state of usefulness and without interference with development of said highway in the future. Wherefore, petitioner prays that said Chicago & North Western Railway Company be required to remove the encroachment and obstructions placed by it upon said South Town Line road and at the point where its said bridge or viaduct crosses the same, and that an order be issued to such effect; and that said Chicago & North Western Railway Company be required to construct and make such drains or sewers at such point as this Commission may determine.

The respondent, in its answer, alleges that it is its intention to have what is known as the South Town Line road, where it crosses the track of the Chicago & North Western Railway Company, put in first class condition and to make it in every way satisfactory.

The hearing was held on Feb. 18, 1911, at the town hall in the city of Wauwatosa. *G. J. Davelaar* appeared for the petitioner and *W. G. Wheeler* for the respondent.

The testimony shows that the railway crosses the highway in question in the southwest quarter of section 32, and that the abutments or retaining walls of the overhead bridge stand within the dedicated highway at about seventeen feet each side of the fence lines. The subway is twenty-four feet wide and has an overhead clearance of thirteen feet. The assistant chief engineer claimed that the width of the subway was sufficient for public travel and that the overhead clearance was adequate and sufficient for an ordinary load of hay to pass under. He testified that the natural drainage had not been interfered with.

Witnesses for petitioner testified that the highway is heavily traveled, farmers traffic predominating, with some automobiles. Two farmers testified that hay in the town of Wauwatosa was occasionally loaded to a height of fourteen feet and to a width varying from twelve to sixteen feet, and that the overhead clearance was not sufficient. The town officials stated that there should be a clearance of at least fifteen feet; they declared that the subway was too narrow and should be widened to thirty feet, the same width as the roadway itself. They also testified that no provision had been made for drainage under the subway; that the abutments were placed in the former water course; that the water now forms other courses and accumulates in a hole or sag of the road which was caused by the railway company in depressing the highway at this point. They claimed that the grade should be lengthened out and gutters made for the free passage of the water. The engineer retained by petitioner in these proceedings likewise testified that the subway interfered with the natural drainage, as the abutments were placed in the path where the water formerly flowed. He stated that an overhead clearance of not less than fifteen feet should be provided; he conceded that the width of the subway might be sufficient at the present time, but did not think it was wide enough for all times.

The engineering staff of the Commission has inspected the crossing in question and recommends that the highway be lowered at the bridge in order to provide a clearance of fifteen feet. In making this depression our engineer states that the grade should be lengthened out and not exceed 6 per cent. He also recommended the increase in size of the ditch leading to the low land in the northwest corner of the crossing, and that a culvert be laid across the highway at the west side of the bridge, sufficient in size to take care of the water which now flows into the highway from the right of way and embankment. The engineering staff considers the subway sufficient in width to take care of much heavier travel than that which may reasonably be expected at this point for a number of years.

It is Therefore Ordered, That the respondent, the Chicago & North Western Railway Company, at the intersection of its Milwaukee-Sparta extension with the South Town Line road in the town of Wauwatosa, so depress the highway as to provide an overhead clearance of fifteen feet at said crossing and in making said depression the highway be lengthened and not exceed a 6 per cent grade.

It is Further Ordered, That a culvert be laid across the highway at the west side of the subway to take care of the natural drainage and that provision be made for drainage at all other points affected by said depression of the highway.

Sixty days is deemed a reasonable period within which to comply with these orders.

IN RE APPLICATION OF THE CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

Submitted April 26, 1911. Decided Aug. 29, 1911.

Petition for authority to construct a line of road from Black River Falls to Vaudreuil, a distance of one and eight-tenths miles. The petition was submitted on the evidence given in the case of *E. J. Vaudreuil Realty Co. v. C. St. P. M. & O. R. Co.* 6 W. R. C. R. 661.

***Held:* That there is not sufficient evidence before the Commission on which a certificate of public convenience and necessity could be granted.**

The petitioner alleges that it owns and operates a line of railroad from Elroy by way of Black River Falls to Hudson in the state of Wisconsin, and a cut-off line direct from Wright to Sheppard with no station intervening thereon; that it desires and proposes to construct a single track line of railroad from Black River Falls in a northerly direction for a distance of about one and eight-tenths miles to a connection in the town of Vaudreuil with its cut-off track, which extends from Wright to Sheppard, the route of which is specifically set forth in the petition and delineated upon a blue print thereto attached; that said proposed line will greatly add to its convenience in the transaction of its business, as well as to the convenience of its patrons at Black River Falls and Vaudreuil, and that there is a necessity for said proposed line; that said line, when constructed, will enable the petitioner to furnish its patrons with railroad service at Vaudreuil, of which they are now deprived, and will enable the petitioner to transact its business at Black River Falls and elsewhere with much greater economy and expedition than it is now able to secure; that its directors by a two-thirds vote have decided that said proposed line of railroad will materially improve its existing line of railroad through Black River Falls and have authorized the construction of the proposed line. Wherefore, petitioner respectfully prays that this Commission should grant to it a certificate of convenience and necessity authorizing the construction of said line in the manner hereinbefore described and in conformity with ch. 454, Laws of 1907, and acts amendatory thereof and supplementary thereto.

The city of Black River Falls and the Black River Falls Advancement Association field objections to the granting of the prayer of the petition as follows:

Now come the city of Black River Falls, a municipal corporation of the state of Wisconsin, and the Black River Falls Advancement Association, composed of citizens of Jackson county, in the state of Wisconsin, and object to the granting of a certificate of public convenience and necessity for the construction of said line of railroad as proposed, and for grounds of objection thereto and in answer to the applicant's petition deny that there is a necessity for said proposed line, or that said proposed line would add to the convenience of the applicant's patrons at Black River Falls. They further allege that there is no necessity for the construction of the line of railroad as proposed in said petition; that the public convenience and necessity for additional railroad service and facilities at Vaudreuil, if any there be, can be subserved by the applicant by the construction and operation of a spur track, extending from its main track at Black River Falls to a point in or near the townsite of Vaudreuil, and west of its so-called cut-off line; that said cut-off line with which it is proposed to connect the proposed line of railroad from Black River Falls to Vaudreuil, is constructed, maintained, and operated by the applicant unlawfully and without authority of law, in that the applicant has no franchise, charter or authority from the state of Wisconsin to construct and operate the same; that the construction and operation of the proposed line of railroad, as hereinbefore described, will cause great loss and damage in the value of taxable property in the city of Black River Falls, and great loss to the property and business interests of members of the Black River Falls Advancement Association.

The matter came on for hearing on April 26, 1911. The petitioner was represented by *J. B. Sheean*, its general solicitor, and *Sanborn & Blake*. E. J. Vaudreuil, appearing in favor of granting the application, was represented by *Kelley & Ledvina*. The city of Black River Falls, appearing in opposition to the granting of the prayer of the petition, was represented by *F. J. Reichenbach,* its city attorney. The Black River Falls Advancement Association, also appearing in opposition to the granting of the prayer of the petition, was represented by *Drew & Jameson,* its attorneys.

At the time of the filing of the application herein there was pending a proceeding instituted by the E. J. Vaudreuil Realty Company against the petitioner to compel the latter to construct a spur track to serve the industries located in the village of Vaudreuil, which is situated on applicant's branch or line of railroad known as the "cut-off," extending between Wright and Sheppard. Ever since the construction of this cut-off the citizens of Black River Falls have been apprehensive that the railway company contemplated ultimately to construct a spur, connected with the cut-off and running to Black River Falls, and thereupon to abandon the main line between Wright and Sheppard. While such change might be desirable from the standpoint of economy in operation and maintenance of the road, it would result in irreparable injury to Black River Falls and could not be made without the consent of the legislature. Under the circumstances, we do not believe that the railway company can be charged with seriously entertaining any such thought. Nevertheless, any community situated on the main line of a railroad is justified in opposing any scheme of re-locating the line which may have for its object an inferior service to such community. The railroad facilities of a city cannot be guarded too closely, as the prosperity and future development of the city is directly dependent thereon.

While there was no apparent objection to the construction of a spur to Vaudreuil, the municipal officers and citizens generally viewed the project as a mere pretense on the part of the railway company to accomplish by indirection that which could not lawfully be accomplished in a direct manner. Their alarm was only intensified when the present application was presented. Although the railway company was vested with ample authority by sec. 1831a to construct the spur in question without the approval or consent of the Commission and could be required to construct the same under sec. 1797—11m, upon the application of the E. J. Vaudreuil Realty Company, or the owner of any industry located in Vaudreuil, it nevertheless seems to have been in doubt as to whether a certificate of public convenience and necessity was not a prerequisite to its right to condemn land for right of way or to construct the spur, and, hence, out of an abundance of caution applied to the Commission for such certificate.

No evidence was offered in this proceeding by the railway company other than that contained in the record in the *Vaudreuil* case. Such evidence was directed to the issues involved in a proceeding instituted to compel the construction of an industrial track. It did not bear upon the question whether public convenience and necessity require the construction of a line of railroad from the "cut-off" to Black River Falls for general railroad purposes. Upon this question no evidence has been introduced.

Another and perhaps secondary reason for presenting the petition here under consideration is found in the statement of counsel for the railway company, which is in part as follows:

> "I am doing this because of the opposition of the people in Black River Falls and their desire to have a hearing and their objection to any high handed work as they often charge railroad companies with being responsible for. The Commission could enter an order in the case now pending which would authorize the construction of this track without this hearing; I preferred, however, out of courtesy and fairness to the Black River Falls people, and owing to their objection to this track, to give them a hearing."

At the conclusion of the hearing in the *Vaudreuil* case the Commission stated that the order prayed for would be granted as soon as the parties could agree upon the terms thereof. Subsequently, and after the hearing in the instant case, the parties agreed upon the terms of the order, and the same was accordingly made and entered. Under the circumstances, further consideration of the application in this proceeding is unnecessary and the same will therefore be dismissed.

Ordered, That the petition herein be and the same is hereby dismissed.

ELECTRIC THEATER ET AL
vs.
LODI ELECTRIC LIGHT PLANT

Submitted June 20, 1911. Decided Sep. 7, 1911.

Petition alleging that the rates charged by the respondent are unusual, exorbitant and discriminatory, and particularly that the schedule of rates for meter rental is discriminatory. From such analysis of receipts and expenses as it is possible to make, it is clear that the earnings of the respondent are not excessive or unreasonable.

It is ordered: That hereafter meters be installed at the expense of the utility; that the minimum bill be fixed at 50 cts. per month; that where meters are owned by consumers, the utility shall acquire the meters or pay an annual rental of $2 per meter; that the utility take immediate steps to conform with the "Uniform Classification of Accounts" prescribed by the Commission.

Complaint has been made by twenty-five citizens of Lodi alleging that the rates charged by the Lodi Municipal Electric Light Plant are unusual, exorbitant and discriminatory. The complaint appears to have come originally from the owners of an electric theater in Lodi, who believe the rates are excessive and who complain particularly of the fact that they are charged a meter rental of 50 cts. per month while other consumers are paying a meter rental of 25 cts. per month.

A hearing in these proceedings was held on June 20, 1911, at the office of the Railroad Commission in the capitol in the city of Madison, and the following appearances were entered: *Harry Simons,* for petitioners. *S. H. Watson,* for respondent.

The rates now in force in Lodi appear to be as follows:

Meter rate:

15 cts. per kw. hr., with no reduction or discount for quantity.

Flat rate:

50 cts. per month per 16 c. p incandescent equivalent.

Municipal contract lighting:

Arc lamps, on a midnight-moonlight schedule at $40 per lamp per year.

Meter rental:

25 cts. per meter per month, except in the case of the electric theater, which is charged at the rate of 50 cts. per month.

Harry Simons testified that he operated an electric theater in Lodi; that by comparison with the rates in other towns the rates in Lodi appeared to be unusually high; and that it was found to be unprofitable to operate the theater more than two nights per week during the summer months, due to the cost of the electricity consumed by the theater. Witness stated that he had no knowledge as to the earnings and expenses of the plant, but that he wished to have the rates reduced if an investigation by the Commission showed that such reduction could be effected. Witness believed that the charge of 50 cts. per month as meter rental, which the theater was compelled to pay, was unreasonable and discriminatory.

In reply to the complaint, the respondent submitted that the earnings of the plants are at present, and have been in the past, insufficient to meet the ordinary expenses of operation and provide for depreciation and interest on the funded debt. Respondent further asserted that the majority of the consumers of electricity in Lodi were small consumers and very sparing in the use of current. Respondent also directed attention to the fact that a number of consumers owned their meters, and that if the meter rental provision was abolished, a minimum monthly charge should be substituted, and that in case such a minimum bill were ordered it would be necessary for the plant to either purchase the meters now owned by the consumers, or allow some rental or deduction for the use of these meters. In regard to the complaint that the electric theater was charged a meter rent of 50 cts. per month while other consumers were charged but 25 cts. per month for the same service, respondent submitted that the meter used by the electric theater is a special meter, costing about $22, and if its use were discontinued by the electric theater it could not be used on any of the other consumer's premises.

DESCRIPTION OF PLANT.

The municipality also owns and operates a water utility, and the generating and pumping equipment are housed in the same building and are supplied with steam from one battery of boilers. The boiler plant equipment consists of two return tubular boilers with a total capacity of 150 horse power.

The electric station equipment includes one reciprocating steam engine of a capacity of 100 h. p., and two direct current generators with a total capacity of 62 kws.

One engineer and an assistant operate the power plant, the assistant also taking care of the distribution system and customers' installations. The superintendent of the plant reads the meters, makes out the bills, and exercises general oversight of the plants.

The report for the year ending June 30, 1911, shows a total number of electric consumers of 106, of which number 72 are metered and 34 unmetered. The street lighting system includes 17 arc lamps and 33 16 c. p. incandescent lamps. Service is given from dusk to 12:00 p. m. for both commercial and municipal contract lighting. There are no power consumers.

FINANCIAL.

In the following table there is shown a comparative statement of the earnings and expenditures of the water and electric plants as reported to the Commission:

COMPARATIVE STATEMENT OF EARNINGS AND EXPENSES.

LODI MUNICIPAL WATER AND LIGHT PLANT.

WATER UTILITY.	*Year Ending*			
	Dec. 31, 1907.	June 30, 1909.	June 30, 1910.	June 30, 1911.
OPERATING REVENUES:				
Hydrant rentals	$980 00	$980 00	$980 00	$980 00
Public fountains	25 00	25 00	25 00	....
Domestic purposes	848 78	1,108 24	1,064 65	1,326 79
Industrial purposes	95 00	67 50	123 10	
Miscellaneous earnings	38 00	....	60 00	....
Total operating revenues	$1,984 73	$2,180 74	$2,252 75	$2,306 79
OPERATING EXPENSES:				
Station operating labor	$410 00	$368 20	$442 25	$480 00
Fuel	630 56	501 75	522 92	625 46
Station supplies and expenses	31 02	20 94	....	27 65
Repairs at station	17 03	21 77	100 24	82 89
Total station expenses	$1,088 61	$912 66	$1,065 41	$1,216 00
Distr. system labor and supplies	19 09	50 00	140 55	124 08
General expenses	52 50	10 00	84 57	88 37
Total operating expenses	$1,160 20	$972 66	$1,290 53	$1,428 45
Available for interest, etc	$824 53	$1,208 08	$962 22	$878 34

ELECTRIC UTILITY.	*Year Ending*			
	Dec. 31, 1907.	June 30, 1909.	June 30, 1910.	June 30, 1911.
OPERATING REVENUES:				
Street lighting	....	$878 00	$1,136 00	$1,076 00
Commercial lighting	....	2,109 69	2,101 31	2,459 27
Miscellaneous earnings	....	....	304 82	....
	$1,800 00	$2,987 69	$3,542 13	$3,535 27
OPERATING EXPENSES:				
Power plant labor	$720 00	$431 60	$698 00	$840 00
Fuel	720 00	788 36	1,567 82	1,881 12
Supplies and expenses	75 00	107 37	135 88	44 16
Repairs at station	30 00	....	27 89	109 80
	$1,545 00	$1,327 33	$2,429 59	$2,875 08
Distribution system expenses	....	54 40	485 90	473 44
General expenses	27 00	160 00	168 16	162 00
	$1,572 00	$1,541 73	$3,083 65	$3,510 52
	$228 00	$1,445 96	$458 48	$24 75

The disbursements from the water and light funds for the year ending June 30, 1910, were taken from the books kept by the village clerk and were distributed as follows:

	Water fund	Light fund
Superintendent	$ 75 00	$ 152 13
Coal	343 76	725 71
Freight on coal	221 29	630 09
Hauling coal	53 41	132 46
Engineer	260 00	360 55
Assistant engineer	182 25	275 00
Repairs at plant	40 82	54 77
Services	69 52	
Extensions of mains	115 77	
Construction at plant	9 62	
Distribution system supplies	1 80	
Repairs of hydrants	6 41	
Electric appliances		375 89
Meters and switches		87 79
Misc. repairs		16 26
Drayage on supplies		33 83
Power plant supplies		1 45
Line work		3 40
Oil and waste		35 89
Freight on meters		85
Misc. supplies & expenses	10 47	59 26
Total	$1.390 12	$2,945 43

Inspection of the records and accounts kept by the village shows that no attempt has been made to keep the operating expenses separate from the costs of additions and extensions or construction accounts. In fact, there seems to have been but little if any effort made to conform to the "Uniform Classification of Accounts" prescribed by the Commission under the provisions of the Public Utilities Law, in this or in other respects. The records of expenditures from the water and light funds were found to be preserved in the form of clippings from the local newspaper, showing the proceedings of the village board. No distribution of the expenses appear to be made as between the two departments or as among the primary accounts, except at the time the annual report to this Commission is due. All records of payments from the water and light funds, for whatever purpose, are kept in the form described above, and the balance sheets show no construction or additions to property during any of the years for which reports have been made to this Commission.

It is not feasible, with the limited information available in this instance, to determine what amount has been expended for additions to property, but it is clear that there are certain items which are of this nature and these must be deducted in order to furnish a basis for computations for rate-making purposes. Again, there are certain costs, such as fuel, wages of engineer and assistant, superintendent, and boiler room supplies and expenses, which are common to both utilities and the basis or bases upon which these items have been apportioned between the two utilities is far from clear. There are no records of the output of the plants, showing the total pumpage and the total current generated. The apportionments made must, therefore, be based almost exclusively on estimates made from the meager data available.

It will be noted that the total expenditures from the water and light funds, as reported to the Commission for the year ending June 30, 1910, do not agree with the totals as found from the inspection of the books for the same period. The difference in the total expenditures is slight, the disagreement being largely one of division between the two utilities. As taken from the books, the total expenditures for the electric plant appear to be about $100 less and the expenditures for the water plant about $100 more than as shown in the reports.

Inspection of the expenditures, as taken from the books, show that there are certain items which are undoubtedly properly chargeable to construction or to the stock account. The following items are noted:

Meters and switches	$ 87 79
Freight on meters	85
Electric appliances	375 89

In the past year there appears among the expenditures of the electric plant the item "cement waterway and tank" cost $28.88. It is difficult to determine with reasonable accuracy what proportion or amount of the total expenditures should be deducted from the total expense of operation as reported in order to arrive at the true cost of operation. It does appear, however, that from $450 to $500 should be deducted from the total expenditures for the year ending June 30, 1910.

It appears that the total cost of fuel has been apportioned between the water and electric plants on a basis of about 30 per cent and 70 per cent, respectively. A total coal consumption of about 517 tons was reported for the year ending June 30, 1910, of which 392 tons were charged to the electric plant and 125 tons to the water plant.

The utility has estimated that its output for the year ending June 30, 1910, was about 14,600,000 gallons for the water department, and about 36,594 kw. hrs. for the electric department. The water is pumped to a reservoir which is reported as being 175 feet higher than the station. Assuming that the outputs as estimated are correct, it is found that the pounds of coal used per million foot-gallons and per kw. hr. are about 98 and 21.4, respectively.

The average output of fourteen Wisconsin electric plants in towns having population between 904 and 1,212 was found to be 46,918 kw. hrs. during the year ending June 30, 1910. The average output per consumer in the same towns was 401 kw. hrs. The average number of pounds of coal used per kw. hr. output in these plants was 16.7.

These figures, together with the results of a similar study of the operation of a number of similar water utilities, indicate quite clearly that the apportionment of the fuel cost between the two departments, as made by the utility, is such as to rather unjustly burden the electric plant.

The salaries of the engineers and assistant engineer, amounting to a total of about $1,077.90 during the year ending June 30, 1910, were apportioned 59 per cent to the electric department and 41 per cent to the water department. Considering the relative daily hours operation of the pumps and generators, and also the fact that the assistant engineer devotes a considerable part of his time to the electric distribution system, this basis of apportionment appears to be a reasonable one.

In the report of the plants for the year ending June 30, 1911, we find that the electric department has been charged with about 83 per cent of the total fuel cost and with about 63 per cent of the station operating labor, thus increasing the burden of the electric department over that of the year ending June 30, 1910.

No valuation of the property of the respondent has been made. The bond issues, which cover the purchase price of the electric plant and subsequent improvements and additions, amount to $11,000. After deducting from the reported expenditures for the year ending June 30, 1910, the items which represented capital outlays, we find that $2,480 more nearly measures the cost of operation. Allowing 4½ per cent on total property for depreciation, or $495, we arrive at a total cost of service, excluding interest on investment, of about $2,975. Since the total operating revenues for the year were reported as $3,542.13, we find that about $566 is available to meet the interest requirements, or about 5.2 per cent on $11,000. The actual rate paid on the $11,000 issues is 5 per cent.

It would appear from these facts that the earnings of the plant are not excessive or unreasonable. While the figures for 1910 as well as 1911 do not appear to be entirely trustworthy in several respects, we are convinced that the earnings of the plant involved here do not appear so high as to warrant us in ordering any material reduction at this time.

From the testimony and the facts revealed by further investigation it is clear that the majority of the users of electricity in Lodi are "small consumers" and are also "short hour users." The average receipts per consumer per month are small and the demand covers but a relatively short period each day.

> "The cost per unit to a plant for furnishing current is greatly affected by the maximum demand on the plant and by the length of time the current is used each day. A high and fluctuating demand and a short time of daily use of the current stands for a relatively high cost per unit. Low or steady demands and long hours use of current stands for relatively low cost per unit. Where between the customers there are considerable variations in the demand and the length of time the current is used, a uniform rate is, therefore, likely to be discriminatory. Where, on the other hand, there are comparatively small variations as between the customers in the demand and in the hours daily use of the current, a uniform rate may not be unfair." *In re Application Darlington El. Lt. & Water Power Co.* 5 W. R. C. R. 397, 414.

The situation in Lodi in this respect is not entirely clear, since but little data have been available as regards individual consumers' demand. It is possible, however, that a uniform rate is warranted in this case. If it appears that such a rate is not warranted, the presentation of facts establishing such a contention will enable us to make the necessary and reasonable revisions in the schedule.

The commercial consumers in Lodi on June 30, 1911, appear as follows:

	Metered.	Unmetered.	Total.
Residences	42	5	47
Offices	9	7	16
Stores	9	20	29
Hotels		2	2
Theaters	2		2
Churches	5		5
Lodge halls	3		3
Bowling alleys	1		1
Schools	1		1
Total	72	34	106

It is evident from inspection of the foregoing table that respondent can undoubtedly improve its policy as regards metering. Those classes of consumers which should usually be metered first of all have, in this instance, been allowed to continue on a flat rate basis. It is the duty of the utility to sell to all consumers through meters unless exempted from so doing by this Commission. Although no demand has been made in this instance for a general extension of the meter system, this fact does not remove the company's obligation to install meters.

It appears that of a total of 72 meters installed, 43 are owned by the respondent while 29 are owned by the consumers.

Those consumers whose meters have been installed and are owned by respondent are compelled to pay a rental to respondent for the use thereof. Those who own their meters escape this rental provision. In establishing a minimum bill for electric consumers in Lodi, the amount of this minimum depends on the costs of collection, interest and depreciation on meters, and other factors. As such a minimum is computed on the basis of expenses which include the interest and depreciation on all meters, justice to those consumers who own their meters requires that they should receive a rental from the utility sufficient to meet the fixed charges on this property.

In view of the condition of the records and accounts of the respondent, and in view of the fact that the earnings, as a whole, do not appear to be excessive, it would appear advisable to dismiss the complaint and defer further action until such time as records will reveal the information which is essential in such proceedings as involved here. The situation as regards the installation and ownership of meters, however, would seem to call for some action at this time. It is the duty of the utility to put in meters unless exempted from so doing by this Commission. When meters are in general use, and the accounts of the utility have been kept in the form prescribed by this Commission and as required by the Public Utilities Law, a revision of the rates may be necessary.

It is Ordered That: Meters shall hereafter be installed at the expense of the utility.

The meter rental provision, now in force, shall be abolished and respondent shall assess a minimum bill of $0.50 per month against all consumers, irrespective of whether consumer or the utility owns the meter.

Where meters are owned by consumers, the utility shall acquire the meters or pay an annual rental to owners of $2 per meter.

Respondent shall take immediate steps to conform with the "Uniform Classification of Accounts" prescribed by this Commission for water and electric utilities, and shall adopt and install the necessary books and forms to so conform.

Thirty days from the date hereof is considered sufficient time within which to comply with this order.

IN RE APPLICATION OF THE FAIRCHILD & NORTHEASTERN RAILWAY COMPANY FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY.

Submitted July 25, 1911. Decided Sep. 13, 1911.

Application for authority to construct a line of railroad from Fairchild, Eau Claire county, to Caryville, Dunn county, Wisconsin.

Held: That the proposed line will serve a territory which is in need of railway facilities; that public convenience and necessity require the construction of the proposed line of railway as applied for.

The petition of the Fairchild & Northeastern Railway Company sets forth that it is a railroad corporation organized under the laws of this state; that for more than ten years last past it has been engaged in the business of operating a railroad extending from Fairchild, in Eau Claire county, Wis., northeasterly through the counties of Eau Claire and Clark to a point in Clark county, and for the past two years has had its northerly terminus at Owen, in said Clark county; that at Fairchild are the general offices of the petitioner; that petitioner desires to extend its line of railway from Fairchild northerly and westerly through the towns of Fairchild, Bridge Creek, Otter Creek, Clear Creek, Pleasant Valley, Brunswick, in Eau Claire county, and into the town of Rock Falls, in Dunn county, Wis.; that said proposed line of railway extends through a richly settled and highly developed agricultural country, which is now without railway service except by the main line of the Chicago, St. Paul, Minneapolis & Omaha Railway Company, located from five to fifteen miles to the north, and the Mondovi branch of said railway company located south, and also by the Chicago, Milwaukee & St. Paul Railway Company at the extreme westerly end of said proposed route; that a large amount of agricultural produce is raised annually by the farmers residing in the territory, which said proposed route will serve if constructed, all of which is now drawn inconvenient and expensive distances to reach a market; that the construction of said proposed line will enable the farmers and others to ship in and out a large amount of freight annually and to deliver their produce cheaply; that the present capital stock of the petitioner is $50,000, but that at a meeting of its stockholders held on Aug. 2, 1910, the capital stock was duly increased to $500,000; that at a meeting of the board of directors a resolution was unanimously adopted authorizing the issue and sale of $1,000,000 of bonds for the purpose of raising funds with which to construct said proposed line; that at said meeting of the board of directors and stockholders a resolution was unanimously adopted authorizing the construction of said proposed extension from Fairchild to a junction with the line of the Chicago, Milwaukee & St. Paul Railway Company in section 15, township 26 north, range 11 west, as more fully appears from the map filed with the petition; that the petitioner has caused a copy of said resolution authorizing the construction of said extension and designating the route thereof to be recorded in its corporate records and a copy of such record, duly certified by its president and secretary, to be filed in the office of the secretary of state as provided in sec. 1831 of the Revised Statutes; that the map filed with the petition shows the line established by the location survey, with its tangent lines, the survey stationing, the property owners through whose property said proposed line passes, the land lines, highways, streets, railroads, water courses, and all other prominent objects along the route; that filed with the petition is a complete profile of said proposed line, showing the line established by the location survey, with the grade line thereof, the rates of grades, the crossing of streams, highways and railroads, alignment notes, and such data relative to the topography of the country through which said route passes as seems essential; that filed with the petition is a general map drawn to scale showing the location of said proposed route with reference to the section and town lines; that no cities or villages are shown thereon for the reason that none such exist within three miles of said proposed line, other than the village of Fairchild. Wherefore, petitioner prays that an order be made fixing a time and place for the hearing of the petition, and that upon the hearing thereof a certificate be issued duly certifying that the construction of said proposed line of railroad is a necessity and convenience.

The matter came on for hearing on Nov. 30, 1910, and again on July 25, 1911. The following were the appearances: ***Bundy & Wilcox*** for the petitioner; and in opposition, ***J. B. Sheean,*** general counsel, and ***Geo. W. Peterson*** for the Chicago, St. Paul, Minneapolis & Omaha Railway Company; ***J. E. Zetchman,*** for the village of Fall Creek; and ***G. O. Linderman,*** for the city of Augusta and the villages of Eleva, Osseo and Strum.

The Fairchild & Northeastern Railway Company owns and operates a line of railway about thirty-eight miles in length, extending from Fairchild, a station on the line of the Chicago, St. Paul, Minneapolis & Omaha Railway Company, to Owen, a station on the line of the Minneapolis, St. Paul & Sault Ste. Marie Railway Company. This line was constructed as a logging road about the year 1882, and fifteen years thereafter was changed to a commercial railroad and has been operated as such ever since. From 50 to 60 per cent of the freight traffic carried on this road is forest products. As the country is becoming settled and the land devoted to agriculture, freight other than forest products is increasing in volume. The company now proposes to extend this line forty-one miles from Fairchild in a northwesterly direction to Caryville, a station on the line of the Chicago, Milwaukee & St. Paul Railway Company.

The Chicago, St. Paul, Minneapolis & Omaha Railway Company's main line to the Twin Cities passes through Fairchild in a northwesterly direction to Eau Claire. It also has a branch known as the Mondovi branch, extending from Fairchild to Mondovi along the northern boundary line of Jackson, Trempealeau and Buffalo counties. The petitioning railway company intends to serve the territory contiguous to its line between the main line and the Mondovi branch of the Omaha road, with the exception of perhaps about ten miles west of Fairchild, which is adequately served by the Mondovi branch and the main line of the Omaha road. However, from that point to Caryville the topography of the country is such that it is difficult for farmers to market their produce advantageously. The country through which the proposed line extends is a rich agricultural region and very productive. A large number of petitions of farmers adjoining the proposed line urging the granting of the certificate herein have been filed. In opposition to the petitions there appeared upon the hearing the Omaha railway company and the representative of the city of Augusta and the villages of Eleva, Osseo and Strum.

The city of Augusta is situated on the main line of the Omaha road, while the other stations are situated on the Mondovi branch. The objecting municipalities contend that the construction of the new line would have a tendency to draw business from them. It is contended that the main line and the Mondovi branch now receive all the products produced in the territory proposed to be served by the new line and that the new line would not be productive of any new business, but would take whatever it received from the main line and the Mondovi branch of the Omaha road.

An estimate was made of the number of acres tributary to the proposed line, the number of acres of same under cultivation, the number of farms, the population of the territory, the amount of products produced, the number of cars received and consumed in and transported out of the territory. This estimate is as follows:

Total number of acres in territory contiguous to the proposed extension of F. & N. E. Ry. in 1909	108,806
Number of acres under cultivation in territory contiguous to extension of F. & N. E. Ry. in 1909	43,401
Number of farms in territory contiguous to proposed extension of F. & N. E. Ry. in 1909	828
Population of territory contiguous to proposed extension of F. & N. E. Ry. in 1909	3,312
Number of bushels of grain in territory contiguous to proposed extension of F. & N. E. Ry. in 1909	736,815
Number of bushels potatoes grown in territory contiguous to proposed extension of F. & N. E. Ry. in 1909	66,554
Number of tons of hay grown in territory contiguous to proposed extension of F. & N. E. Ry. in 1909	17,041
Number of head of live stock raised for market in territory contiguous to F. & N. E. Ry. in 1909	8,548
Number of cars of produce grown for market in territory contiguous to proposed extension of F. & N. E. Ry. in 1909	1,135
Number of cars freight received in and consumed in territory contiguous to proposed extension of F. & N. E. Ry.	272
Total number of cars of freight transported both in and out from territory contiguous to F. & N. E. Ry. in 1909	1,407

It was also shown that for the year preceding Dec. 31, 1910, the Omaha road received 3,032 cars and forwarded 3,683 cars, on its main line, at and from stations between Fall Creek and Fairchild, both inclusive, and on its Mondovi branch.

It was not deemed that the main line west of Fairchild would be seriously affected by the proposed road. However, it is not possible to estimate the exact effect the proposed line might have upon the amount of freight hauled by the Omaha road. It would not affect the Mondovi branch to any appreciable extent, and as the volume of products produced in the territory south of Eau Claire, which will be principally served by the proposed line, is now taken to Eau Claire and there shipped out over three different railway systems, the main line of the Omaha would, in all probability, be but slightly affected. However, the new line would doubtless develop a traffic of its own resulting from the raising of other products than those which are now raised in that territory. It appears that grain is the principal product produced because of the long distance and difficulty of hauling other produce to market. Root crops and other heavy products cannot be raised profitably because of the inability to market them, except at a prohibitive cost. The territory is peculiarly adapted to the raising of root crops and the farmers are desirous of so doing, providing railway facilities are provided.

Without attempting to review the testimony in detail, we are satisfied that the proposed line will serve a territory which is in need of railway facilities and at the same time not injure the Omaha railway company or the objecting municipalities. The distance between Mondovi and Eau Claire is sufficiently great to justify the construction of a line that will serve the central portion of the territory. The petitioning railway will then be in a position to convey its freight to and make business connections with the "Soo" line at Owen, the "Omaha" line at Fairchild, and the Chicago, Milwaukee & St. Paul Railway at Caryville. If the line in question were merely to serve the territory extending ten or fifteen miles west of Fairchild, we should feel no hesitation in declining to grant the authority to construct the same, because there is no public convenience or necessity that requires it. Nevertheless, when we take into consideration thirty miles of the proposed line east of Caryville, we are convinced that there is a demand for the line in question.

Under the circumstances we have found and determined that public convenience and necessity require the construction of the proposed line of railway as applied for.

TOWN OF WAUWATOSA
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted Feb. 18, 1911. Decided Sep. 15, 1911.

Petition alleging that the existing trestle over the tracks of the respondent on the Blue Mounds road is inadequate, and praying that respondent be required to construct a trestle of a permanent nature and adequate and safe approaches the full width of the highway, and provide proper drainage. From the testimony taken and investigations made, it appears that the bridge and approaches, when finally completed in accordance with the plans of the respondent, will fully meet the requirements of the traveling public. Petition dismissed.

The petitioner is a municipal corporation of Milwaukee county. The petition is signed by the town board of supervisors, and states that the town of Wauwatosa is situated and lies contiguous to and directly west of the city of Milwaukee; that it is very thickly populated and contains many large quarries and manufacturing industries; that its highways, particularly those extending east and west, are subjected to a very heavy traffic, both by team and motor vehicle; that the Chicago & North Western Railway Company is constructing and building what is known as the Milwaukee, Sparta & North Western Railway, being, as petitioner is informed, an extension of its present railroad system; that said extension crosses a highway in said town of Wauwatosa known as the Blue Mound road; that the said Blue Mound road is a highway running east and west in said town of Wauwatosa connecting on the east with Grand avenue, one of the principal thoroughfares and business streets in the city of Milwaukee, and on the west, in Waukesha county, with the Watertown plank road, which connects with the city of Watertown; that the said Blue Mound road is an outlet to a viaduct which has just been constructed by Milwaukee county, which said viaduct as a highway is to be part of a comprehensive scheme of certain driveways, parkways and parks in the city of Milwaukee and in Milwaukee county; that said highway is subjected to a very heavy daily traffic, both by team and automobile, and which travel, by reason of the improvements hereinbefore alleged, will in the future be largely increased; that said Blue Mound road is a highway sixty-six feet in width, and that the town of Wauwatosa maintains thereon a wide roadway and also expends a great deal of money in its maintenance, all of which is required for the convenience and safety of the public and traffic upon said highway.

The petition further states that at the point at which said Chicago & North Western Railway crosses said Blue Mound road it does so by depressing its roadbed and tracks and has constructed a wooden trestle at said point for the purpose of crossing its roadway and tracks, and that the same is inadequate and unsuitable to the needs of this highway, which requires a substantial structure of sufficient width so as not to interfere with the traffic, usefulness and development of said highway in the future; that said railway company has placed fences along the approaches to said trestle within the highway proper and has provided only twenty-two feet of roadway on the trestle and thirty-one feet of roadway on the approaches; that the said trestle, approaches and fences, as placed and constructed by said railway company, are an obstruction and encroachment upon said highway, interfering with the public use and needs thereof and the improvement of the same, and that the public use and safety require that said highway be left open and unobstructed to its full width of sixty-six feet.

The petition further states that the said railway company, in the construction of said trestle and approaches, has failed to make any provision for the drainage of the trestle or roadway by it constructed, and that it is necessary to the public use of said highway and the protection thereof that there be provided drainage by tile or sewer therefor and placed in such manner as to be most serviceable and practicable for the purposes intended. Wherefore, petitioner prays that said Chicago & North Western Railway Company be required to construct a trestle across its said tracks, of a permanent nature and of the full width of said highway, and that said Chicago & North Western Railway Company be required to build the said approaches to said trestle of the full width of said highway and to place a fence along the road line of said approaches so constructed, and that said Chicago & North Western Railway Company be required to remove the encroachment and obstructions placed by it upon said Blue Mound road, and that it be required, in the construction of said trestle and approaches, to provide sufficient drains or sewers for the use and protection of said highway, and for such other and further relief as this Commission may determine.

The respondent, in its answer, alleges that it is its intention to have what is known as the Blue Mound road, where it crosses the track of the Chicago & North Western Railway Company, put in first class condition and to make it in every way satisfactory.

The hearing was held on Feb. 18, 1911, at the town hall in the city of Wauwatosa. *G. J. Davelaar* appeared for the petitioner. *W. G. Wheeler* represented the respondent.

The testimony shows that Blue Mound road is one of the most important highways in the town of Wauwatosa and is heavily traveled by carriages and automobiles; there is also a small amount of farm traffic. The highway is crossed by the railway in the eastern portion of the northeast quarter of section 30. The town clerk testified that Blue Mound road had a width of sixty-six feet and that during the year 1910 the town spent $5,429.02 in keeping it in good condition. The engineer retained by the petitioner stated that the approaches had a width of thirty-one feet for a distance of sixty-three feet and then narrowed to a width of twenty-two feet at the trestle proper, and that the length of the approaches and trestle fenced in was one hundred ninety-six feet. He and the other witnesses for petitioner believed that the approaches should be the full width of the highway, and that the bridge should be forty feet wide. The town engineer urged the construction of a concrete bridge and also concrete walls or iron fences along the approaches. He further testified that no provision had been made for drainage. One of the town officials testified that the railway company had left a steep embankment west of the trestle unprotected and stated that a fence or other barrier should be erected to protect travelers at that point. The assistant chief engineer of the railway company submitted plans of the completed structure, and testified that the bridge supports would be of piling, but that the structure would have an iron floor with a plank wearing surface and have iron railings; the width of the bridge would be thirty feet in the clear between wheel guards. He stated that at the present time the bridge and the approaches were not completed and that the general situation was in an unfinished condition. It was his opinion that when the bridge was completed according to the plans, that it would be adequate to take care of the travel. The plans called for a width of thirty-two feet for the approaches.

Several inspections of the crossing have been made by our engineering staff and reports submitted, from which it appears that the approaches to the overhead bridge are practically level on both sides. The present bridge is twelve or fifteen feet wider than the traveled portion of the highway, therefore the structure and approaches, as planned, appear to be wider than necessary for the present traffic and should fulfill all requirements for a considerable period of time. In his oral argument some objection was made by petitioner's counsel to a knoll existing west of the bridge, which he considered a source of danger. Our engineer considers it inadvisable that any additional cut be made in the knoll, as the north and south road, which parallels the railroad track, junctions the east and west road near this point, and should the knoll be lowered any, a steep and objectionable approach would be necessary for the north and south roads. As to the question of drainage, inspection was made immediately following a comparatively heavy rain and at a time when a considerable amount of water was found at many points in the highway, and no water was found on the bridge or any part of the approaches and road constructed by the railroad company. It appears that the bridge and approaches constructed in accordance with plans as submitted by the railway company will fully meet the requirements of the traveling public.

Therefore, the petition is hereby dismissed.

A. P. NELSON ET AL,
VS.
NORTHERN PACIFIC RAILWAY COMPANY.

Submitted Feb. 16, 1911. Decided Sep. 15, 1911.

Petition alleging that the passenger and freight service and the depot facilities at Grantsburg are inadequate.

Held: **That the present passenger train service at Grantsburg is inadequate; that the station is too small to meet the reasonable requirements of the public.**

It is ordered: **That the respondent run an additional daily train and within ninety days provide an adequate station building.**

The petitioners are, and have been for the past thirteen years, residents of the village of Grantsburg, Wis., and are interested in various business enterprises in said village. They allege that the passenger and freight service and the depot facilities provided by the respondent railway company at Grantsburg are inadequate at the present time, and pray for an order compelling respondent to furnish additional train service and proper depot facilities.

The respondent railway company, answering the petition, admits all the formal allegations thereof, but denies that the Grantsburg branch yields any profit. It also denies that its passenger service is inadequate and, on the contrary, states that the service and facilities furnished to residents of Grantsburg and the surrounding country tributary thereto are in all respects equal to those provided for any of its branch lines, and therefore prays that the petition be dismissed.

The hearing was held at Grantsburg on Feb. 16, 1911. *Walter Drew* and *A. J. Myrland* appeared for the petitioners, and *Emerson Hadley* appeared for the respondent.

Grantsburg is a station situated on a branch line of respondent's railway system, commonly called the Grantsburg branch, which extends from Rush City, Minn., to Grantsburg, Wis. The village has a population of upwards of 800. It is the county seat of Burnett county, and the only important railroad station in the county. There is no other line of railroad in Burnett county. The nearest railroad station to Grantsburg is Frederic, Wis., which is located on the Minneapolis, St. Paul and Sault Ste. Marie Railway in Polk county, and is about seventeen miles distant from Grantsburg. Located in the village are a number of business houses of different kinds. Large quantities of freight and express are shipped from this station. A statement of freight and passenger receipts prepared by the respondent's auditor shows that for the three months ending Nov. 30, 1910, freight received at this station amount to $13,061.01 and the passenger revenue amounted to $6,245.35.

There is one mixed train each way running between Grantsburg and Rush City. This train contains one passenger coach and a combination coach used for baggage and express matter, which also has a smoking compartment. The testimony shows that these cars are poorly lighted and heated, and are unclean; that the oil from the lamps drips upon the clothing of passengers and that the seats which had been broken or injured remained in that condition without repair for an unreasonable length of time. There is but one toilet room in the passenger car, which is used by both sexes.

As to the complaint relative to depot facilities, it appears that the depot is a small structure, its outside dimensions being 18x86 feet. It is inadequately lighted, heated and ventilated. One-third of the ladies' waiting room is practically taken away by reason of the steps leading to the freight room. Prior to the filing of the complaint herein, both the ladies' and gentlemen's waiting rooms were usually filled with perishable products awaiting shipment. The station was not provided with a warm room for storing freight, but since the complaint has been filed the respondent has constructed a small room in which a stove has been placed, so that perishable freight may be kept from freezing during cold weather.

It is also complained that with the present schedule of trains it is impossible for business men to answer important correspondence and send letters by mail until noon of the day following the receipt of such correspondence. The train arrives at 11:25 a. m. and departs at 12:01 p. m. Persons desiring to transact business in Minneapolis find train connections so poor that at least three days' time is consumed in going from Grantsburg to St. Paul or Minneapolis and return. One is obliged to wait until 12:01 p. m., when the train departs from Grantsburg. This train reaches Rush City at 12:52 p. m. If it makes connection with train No. 62 from Duluth and Superior on the main line, passengers and express are transferred to the same. Train No. 62 arrives in St. Paul at 2:55 p. m. and Minneapolis at 3:35 p. m. If, however, this connection is not made, which seems to occur frequently, passengers are obliged to wait at Rush City until 4:51 p. m. and then do not arrive at St. Paul until 6:20 p. m. and Minneapolis at 7:00 p. m., which is too late to transact business. The train leaves St. Paul for Grantsburg at 8:50 a. m. Consequently, if a person going to St. Paul should miss connection with train No. 62 at Rush City, it would necessitate his remaining in St. Paul or Minneapolis two nights in order that he might be able to transact his business. Persons desiring to go from Grantsburg to Duluth or Superior encounter the same difficulty. Passengers are obliged to wait at Rush City from 12:52 p. m., when the train arrives from Grantsburg, until 4:00 p. m. for the train going to Duluth and Superior. They therefore are unable to arrive at Superior or Duluth until 6:33 p. m. Returning from either of these points they are obliged to take the train which leaves at 11:10 p. m. and reaches Rush City at 4:00 a. m. They are therefore obliged to remain at Rush City from 4:00 a. m. until 10:40 a. m. when the train leaves for Grantsburg.

The train service from Frederic station is much better than from Grantsburg, and consequently a large number of people drive from Grantsburg to Frederic to take trains. The freight business, however, does not seem to be directed to Frederic to any great extent, on account of the poor condition of the highways, which renders it impracticable to haul heavy loads. It is contended on the part of the petitioners that, because of the large amount of freight handled at Grantsburg, the railway company is unable to maintain its passenger schedule, and, as it has but one train daily, those who desire to use the respondent's line in going to and from Grantsburg are greatly inconvenienced. It is the desire of the citizens of Grantsburg to have an additional train put in service daily between Rush City and Grantsburg.

It was also shown that the shipment of fruit and livestock is very important at this station. It appears that because of the inadequate train service it is impossible to get berries to market until the day after they have been picked. Dressed veal and poultry are also delayed too long in transit for the market. It was the opinion of those testifying on behalf of the petitioners that, if better service were secured, other products would be raised in this territory which cannot be raised advantageously at the present time because of the inability to market them seasonably.

On the part of the respondent testimony was offered to show that the delay occasioned in handling freight was due to a switchmen's strike which lasted from Nov. 30, 1909, until about the first of April, 1910. This caused the Grantsburg train to miss the connection at Rush City. It was also stated that some accidents which occurred along the line contributed to the delay. It is contended that the connection at Rush City has not been broken since the complaint herein was filed. The general order issued regarding the connection with the train going south, now in effect, is that such train shall wait one-half hour, or, in case of a large number of passengers desiring to take the train south, a reasonable time in addition is allowed. The discretion in the matter is vested in the dispatcher, who issues an order daily upon the subject. Witness on behalf of the respondent expressed the opinion that the revenues derived from passenger business on this line did not justify an additional train. This, however, did not take into consideration the possible increase in traffic if the service were improved.

As to the station it was conceded that an extension and improvement were imperative.

Relative to the condition of the coaches of which complaint was made, the respondent showed that a man is employed to clean the coaches inside and outside daily; that the broken seat, to which reference was made, had been broken by an intoxicated man and was repaired as soon as the proper parts could be secured, but delay in repair was caused because of having received the wrong style of bracket, which had to be returned and a proper bracket obtained; that in all, the seat remained in an unrepaired condition but about ten days. It was also stated that the coach now in use was a new one which had only been received from the shop the summer previous. It seems to have been sent to the repair shop in November because of an accident occurring in switching the car at Playfield, which resulted in the breaking of several windows and scraping the outside of the car. As to the unsanitary condition of the car caused by the dripping of the oil from the lamps and by the dust, it was claimed that it was not possible to prevent the lamps from dripping without emptying them of oil, or to keep the cars entirely free from dust and dirt because the run is through a territory of white sand.

Relative to the contention of petitioners that an additional train should be placed in service which should leave Grantsburg early in the morning and return in the evening, it was claimed that this would necessitate the construction of an engine house to care for the engine, a water tank and pumping plant and the employment of an attendant; also, in order to run a train from Rush City to Grantsburg connecting with the afternoon train from the Twin Cities, an additional train crew and engine would be required.

From the showing made upon the hearing, we are clearly of the opinion that the train service now afforded by the respondent to the citizens of Grantsburg and vicinity is unreasonably inadequate. We have delayed entering an order in this matter in the hope that the respondent could arrange its schedules so as to furnish two trains daily in and out of Grantsburg, which would accommodate passenger traffic. This, however, the railway company has not seen fit to do up to the present time.

As to the station facilities, a personal examination of the station in connection with the testimony given upon the hearing convinces us that more adequate facilities for passenger and freight traffic must be provided at Grantsburg. Relative to the size and character of the building, we may say that the railway company is in position to determine more accurately such matters than anyone else. As we said in *Lieneman v. C. M. & St. P. R. Co.* 2 W. R. C. R. 88, 91:

"All of these are factors regarding which the Commission has no definite knowledge, and even if it had this knowledge it would scarcely be justified in prescribing, with requisite detail, matters relating to such a thing as the construction of a railway station. We do not believe that in the present case we should prescribe the exact dismensions of the proposed station. That should properly be left, in the first instance, to the best judgment of the railway company, and if the kind of a station which the railway company may construct should prove to be inadequate, the Commission will then entertain a complaint with reference to the same and render such a decision as the merits of the question may warrant."

It is therefore the judgment of the Commission that the present passenger service afforded by the respondent railway company to the village of Grantsburg is inadequate, and that the station at that point is too small to meet the reasonable requirements of the public.

Now, THEREFORE, IT IS ORDERED: 1. That the Northern Pacific Railway Company be and the same is hereby required to run an additional train carrying passengers on its line between Grantsburg and the west boundary line of the state of Wisconsin, so that the citizens of Grantsburg and vicinity may have reasonable passenger service twice daily each way, except Sunday.

2. That the said railway company provide an adequate station building at Grantsburg, which shall be reasonably adequate for the passenger and freight traffic obtaining at that station, according to its adopted standards of construction.

Ninety days is deemed a reasonable time not later than which such station shall be completed and open to public traffic.

CITY OF PLYMOUTH
vs.
CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY, CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted July 10, 1911. Decided Sep. 18, 1911.

Petition alleging that the station facilities at Plymouth are wholly inadequate and insufficient and that the building is in a dilapidated condition and unsanitary. It was shown at the hearing and admitted by the respondents that new station facilities are required.

***It is ordered:* That within nine months the respondents erect adequate passenger depots in accordance with plans to be submitted to the Commission.**

The petition, signed by the city attorney of Plymouth, sets forth that the petitioner is now and since Jan. 1, 1898, has been a municipal corporation, organized and existing under and by virtue of the laws of the state of Wisconsin; that the above named railway companies are common carriers engaged in the transportation of persons and property by railroads between points in the state of Wisconsin, and that as such common carriers said railroad companies are subject to the provisions of ch. 87 of the Wisconsin Statutes of 1898 and acts amendatory thereof, and likewise subject to the provisions of ch. 362 of the Laws of 1905 and acts amendatory thereof; that within the limits of the said city of Plymouth there is a junction of the respondent railway companies and that for many years a joint passenger depot has been maintained in said city by said companies; that the present passenger depot of said railway companies in said city was erected in the year 1887 to take the place of an old frame structure of about the same dimensions, which was destroyed by fire; that the said present passenger depot is an old frame structure and that the dimensions of the waiting rooms for passengers therein are as follows: the waiting room for men therein is 18 feet by 20 feet in size and has seating capacity to accommodate only sixteen persons; the ladies' waiting room is in size 15 feet by 18 feet and has seating capacity for only ten persons; that there is an outside toilet room under a separate roof which is wholly inadequate and is always in a filthy condition and unfit for use; that the said city of Plymouth has a population of 3,094 inhabitants, as shown by the last census, and is an important shipping point, and that there is a large passenger traffic to and from said city, owing in part to the junction of said two railroads; that frequently there is not standing room sufficient to accommodate the passengers and that it often happens that large numbers of passengers are obliged to suffer the inclemency of the weather and get drenched in the rain because of the inadequate facilities of said passenger depot and station; that the platform for passengers at said station is wholly inadequate and insufficient; that said passenger depot is wholly inadequate and insufficient for the accommodation of passenger traffic at said city of Plymouth, and that the building is in a dilapidated condition, out of repair and unsanitary; wherefore, petitioner prays that the aforesaid railway companies be required to answer the charges herein and that after due hearing and investigation an order be made commanding said railway companies to construct either a joint passenger depot which shall be adequate in size for the purpose of accommodating the passenger traffic at said city of Plymouth, or that said railway companies be required and directed to construct separate depots or stations for such accommodation of passengers, which shall be reasonably adequate and sufficient for the purpose, together with suitable toilet accommodations; and for such other and further order as this Commission may deem necessary and just in the premises.

The Chicago, Milwaukee & St. Paul Railway Company answered the petition separately, admitting that petitioner is a municipal corporation under the laws of Wisconsin; admitted that this respondent company is a common carrier subject to the provisions of ch. 87 of the Wisconsin Statutes of 1898 and acts amendatory thereof, and to the provisions of ch. 362 of the Laws of 1905 and acts amendatory thereof; admitted that a joint passenger station is maintained at Plymouth by the respondent companies, but denied that the present structure is inadequate or insufficient for the accommodation of passenger traffic from Plymouth or that the building is in a dilapidated condition, out of repair or unsanitary, or that there is not reasonable room to shelter the patrons of its company from the inclemency of the weather; and it further denied each and every allegation in said complaint not admitted, denied or otherwise answered. Wherefore, this respondent prays that the petition be dismissed.

The Chicago & North Western Railway Company did not answer the petition formally, but its Wisconsin attorney wrote the Commission just prior to the hearing, stating that the company would be willing to construct a new depot next year, according to tentative plans which he submitted, and suggested that if such plans were approved by the Commission it would not be necessary to have the hearing.

The hearing was held on July 10, 1911, at the city hall in the city of Plymouth. *M. C. Mead* appeared for the petitioner, *H. J. Killilea* for the Chicago, Milwaukee & St. Paul Railway Company, and *C. A. Vilas* for the Chicago & North Western Railway Company.

Witnesses for the petitioner testified that the present depot is inadequate to accommodate the traveling public; that frequently passengers are compelled to remain on the platform in inclement weather, owing to insufficient standing room in the waiting rooms; that on many occasions the platform is too small to adequately accommodate the passengers, and that the toilet facilities as provided and maintained by the respondents are unfit for use. The mayor of Plymouth testified that for the past two years he had occasional interviews and correspondence with officials of both railways and they had never disputed the necessity of a new depot, but had assured him that new depot facilities would be provided either jointly or separately at an early date. The city attorney testified that the two waiting rooms in the depot had seats for but twenty-nine persons, while the two companies sold an average of one hundred and four tickets per day. Such statement did not include passengers using mileage books. The same witness stated that the freight receipts of the Chicago & North Western Railway Company for the year ending Jan. 1, 1911, amounted to $96,144. Council for the Chicago, Milwaukee & St. Paul Railway Company stated that the freight receipts of his company at Plymouth for the year ending May 1, 1911, amounted to $121,609.46, while the receipts for passenger tickets sold during the same period amounted to $17,122.98. The passenger receipts of the Chicago & North Western Railway Company were not given, but excluding these, the total receipts of both companies amounted to $234,866.45.

The division superintendent and the division engineer of the Chicago & North Western Railway Company stated that the company intended to build a separate combined freight and passenger depot, 24 feet by 120 feet, which would necessitate considerable change in the present layout of the tracks, and that the proposed plan, as submitted by them, would be the most practicable utilization of the right of way owned by them. It was further stated that if the two companies built a new joint passenger depot, the Chicago & North Western Railway Company would have insufficient room to build a new freight depot, as it has only a limited area for station facilities, the new freight depot being necessary within two years.

Council for the Chicago, Milwaukee & St. Paul Railway Company admitted the necessity of a new depot and stated that if the Chicago & North Western Railway Company built a separate depot, the Chicago, Milwaukee & St. Paul Railway Company would be obliged to erect one on its own right of way, which would also require a change to be made in its present track system. He urged that as much time as possible be given the respondents in which to make the desired improvements and he agreed to furnish the Commission a plan of the proposed new depot and track changes.

Now, THEREFORE, IT IS ORDERED, That the Chicago, Milwaukee & St. Paul Railway Company erect an adequate passenger depot in the city of Plymouth in accordance with plans to be submitted to the Commission for approval.

IT IS FURTHER ORDERED, That the Chicago & North Western Railway Company erect an adequate passenger depot in the city of Plymouth in accordance with plans to be submitted to the Commission for approval.

Nine months is deemed a reasonable time within which to comply with these orders.

CONNOR LAND AND LUMBER COMPANY
vs.
CHICAGO AND NORTH WESTERN RAILWAY COMPANY.

Submitted June 30, 1911. Decided Sep. 23, 1911.

Petition alleging that on Jan. 15, 1911, by stipulation after petition was filed, the rates on lumber between Laona and points within the state were greatly reduced, and praying for a refund on all shipments made in the four and one-half years prior to such date. It was conceded that under sec. 1797—37m, the jurisdiction of the Commission is limited solely to claims arising in relation to shipments made within six months prior to the filing of a petition, but it is contended by the petitioner that such limitation in no wise acts as a bar to claims on shipments made previous to such six months period.

Held: **That no action can be instituted to recover any alleged overcharge until the Commission has condemned the charge actually collected under the statute; that, the jurisdiction of the Commission being limited to a six months period, it cannot investigate the reasonableness of the charges made at any time previous, and that a finding that a rate is exorbitant or unusual at any given time is not a condemnation of such rate for any other time previous thereto; that the rates exacted on shipments reaching their destination within six months of the date of the filing of the petition were unusual and refund is ordered.**

The petitioner alleges that for more than ten years last past it has been and now is a Wisconsin corporation and the owner of a large amount of timber and lands in Forest county, Wis.; that it has operated during all of said time and now operates a large lumber mill and plant for the manufacture of lumber products at Laona in said county; that it has been and is engaged in selling and shipping lumber products over the respondent's railway and its connections from said Laona; that the respondent has been during all of said time and now is a common carrier of freight for hire over its line of railway from said Laona to various points in this state and particularly to Green Bay, Manitowoc, Sheboygan, Port Washington and Milwaukee; that during all of said time the respondent had issued, published and had in force, upon timber products from said Laona to said points of destination aforesaid certain tariff rates, which rates were common with a large number of other initial points on said line within what was and is known as the Rhinelander group, and had other and lower tariff rates from other, though more distant, points to said destinations within the so-called Wausau group; that previous to about May 21, 1907, said Rhinelander group rates were applicable alike to said Laona and south thereof to and including Wabeno, upon said respondent's route, and upon application to this Commission by the G. W. Jones Lumber Company, after a full hearing and consideration, it was decided and ordered that said respondent desist from charging Rhinelander group rates upon timber products from said Wabeno, and was commanded to charge thereon, from said Wabeno, rates not in excess of the Wausau group rates; that thereupon said respondent changed the rates accordingly, extending said Wausau group rate to within five miles south of said Laona station; that on or about Oct. 25, 1910, this petitioner duly filed with the Commission its petition praying, from the facts therein set up, that the said respondent be ordered to cease and desist from classifying said Laona station with the said Rhinelander group and applying to the lumber product shipments therefrom the unreasonable and unjust rates then in force and effect, and to publish and maintain rates on such freight from said Laona not greater than Wausau group rates to points of destination within said state of Wisconsin; that thereafter, and on or about Jan. 15, 1911, the said respondent, by stipulation and agreement, promulgated, published and put in force on such traffic from said Laona to said terminals above named greatly reduced rates as compared with said then existing Rhinelander group rates, and has since maintained the same, and said last above named petition was thereupon by stipulation withdrawn and dismissed; that the rates in force and actually charged and collected by said respondent from the petitioner upon carload lumber and lumber products freight from Laona to said destinations, for more than six years last past, have been unjust, unreasonable, exorbitant, discriminating and unlawful, and that said respondent should be ordered and required to make reparation thereon to the extent that such rates charged and collected previous to said Jan. 15, 1911, have exceeded the present rates per 100 lbs., that is to say, upon all such carload shipments to Sheboygan the refund should be 1½ cts. per 100 lbs., on shipments to Green

Bay ½ ct. per 100 lbs., on shipments to Milwaukee 1 ct. per 100 lbs., on shipments to Manitowoc 1½ cts. per 100 lbs., and on shipments to Port Washington 1 ct. per 100 lbs.; that attached to the petition and made a part thereof is a statement of all shipments of such traffic so made by the petitioner to the destination points aforesaid since January 1907, showing the amount unlawfully overcharged thereon by said respondent, and from the same the petitioner alleges that the respondent is justly indebted to the petitioner because of such unjust, exorbitant and unlawful charges within said period, the sum of $1,622.58 and interest thereon from the dates of said several shipments aforesaid. Wherefore, petitioner prays that the respondent may be required to answer the charges and complaint aforesaid and be ordered and required to make payment to the petitioner of said sum covering said period, or such part thereof as may be found justly and lawfully due, and for such further order and direction in the premises as may be just and reasonable.

The respondent railway company, answering the petition, admits all the formal allegations thereof, and denies that the rates in force and actually charged by it to the petitioner upon carload lumber and lumber products from Laona to the points of destination mentioned in the petition, for more than six years last past, have been unjust, unreasonable, exorbitant, discriminating or unlawful, and, upon the contrary, alleges that such rates were just, reasonable, and neither exorbitant nor discriminatory. Wherefore, the respondent prays that the petition be dismissed.

The matter came on for hearing at the city of Milwaukee on June 30, 1911. The petitioner was represented by *Thomas H. Gill,* its counsel, and the respondent by *C. C. Wright,* its general solicitor, and *William G. Wheeler,* its Wisconsin attorney.

The claim presented in this case covers numerous shipments made during the past four and one-half years. While it is conceded that the action of the Commission under sec. 1797—37m is limited solely to determining whether the charges exacted by the carrier for such shipments in controversy as reached their destination within six months prior to the time when the shipper complained to the Commission of the alleged overcharge are erroneous, illegal, unusual, or exorbitant, and if found to be either erroneous, illegal, unjust or exorbitant, to ascertain the reasonable rate, the contention is nevertheless made that in an action at law to recover any overcharge found by the Commissioner to have been made by the carriers on such shipments as reached their destination within such period of six months, such limitation in no wise operates as a bar to that portion of the claim which relates to shipments made at any time previous to said six months, but within a period of six years, prior to the commencement of such action.

The effect of this statute upon transportation charges eliminated from consideration in this proceeding by its express terms is a matter for judicial decision. However, as counsel have argued the question fully, it may not be inappropriate under the circumstances to express our view on one or two phases of the subject.

It is admitted that no action can be instituted to recover any alleged overcharge exacted by the carrier until the Commission has condemned under the statute the charge actually collected. The reason for this is found in the fact that the rates of the carrier, filed and published as required by the statute, are the lawful rates, from which neither the carrier nor the shipper can depart. Such rates cannot be changed except by the Commission in the manner provided by the statute.

> "This is clearly so, for if it be that the standard of rates fixed in the mode provided by the statute could be treated on the complaint of a shipper by a court and jury as unreasonable, without reference to prior action by the Commission, finding the established rate to be unreasonable and ordering the carrier to desist in the future from violating the act, it would come to pass that a shipper might obtain relief upon the basis that the established rate was unreasonable, in the opinion of a court and jury, and thus such shipper would receive a preference or discrimination not enjoyed by those against whom the schedule of rates was continued to be enforced. This can only be met by the suggestion that the judgment of the court, when based upon a complaint made by a shipper without previous action by the Commission, would give rise to a change of the schedule rate and thus cause the new rate resulting from the action of the court to be applicable in future as to all. This suggestion, however, is manifestly without merit, and only serves to illustrate the absolute destruction of the act and the remedial provisions which it created which would arise from a recognition of the right asserted. * * * Indeed the recognition of such a right is wholly inconsistent with the administrative power conferred upon the Commission and with the duty, which the statute casts upon that body, of seeing to it that the statutory requirement as to uniformity and equality of rates is observed." *Texas & Pacific R. Co. v. Abilene Cotton Co.* 204 U. S. 426, 440.

Soon after sec. 1797—37m, under which this proceeding is instituted, became effective, we had occasion to construe the effect of the same in another situation, although somewhat analagous in principle to the one here presented. *Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 2 W. R. C. R. 116. In that case petitioner sought to recover certain alleged overcharges for transportation which had taken place within a period of six months prior to the enactment of said section of the statute. It was argued on the part of the claimant that this section did not bar the common law remedy and that hence the same should be construed as retroactive. The Commission reached a contrary conclusion. After reviewing a number of authorities it expressed itself as follows (p. 123):

"In the light of the foregoing considerations we are constrained to hold that the act of 1905 superseded the common law; that the charges, collected by respondent from complainant in accordance with the printed schedules duly filed pursuant to the provisions of the act, were legal and, therefore, not unreasonable within the contemplation of the act; that the only remedy provided for altering rates, when found by the Commission to be unjust and unreasonable, is that prescribed by the statute; that the changing of a rate by the Commission because the same is found to be unjust and unreasonable, does not render such rate unjust and unreasonable *ab initio;* that all schedules of rates printed and filed as required by the act are legal and binding upon both shipper and carrier until changed by the Commission; and that any change made by the Commission in any rates contained in such schedules because the same are unreasonable, only operates to make such rates unjust and unreasonable from the time of the taking effect of the new or substituted rates. Consequently it must follow that a shipper has no legal or moral claim to any excess charge if the change resulted in a lowering of the rate which he paid for the service. Any other conclusion would manifestly have led to insurmountable difficulties, inconsistences and contradictions in the administration of the law and defeated its very policy and purposes.

"From the view we have thus taken it necessarily follows that the amendment to the act is not merely remedial in its character, nor does it merely give a remedy for an existing right. It confers the right and provides the remedy to enforce it. It has, therefore, no application to a case where the rights of the parties were fixed before its adoption."

It will be observed that the statute in question limits the scope of investigation by the Commission to ascertaining whether the rate challenged is exorbitant when applied upon shipments which reached their destination within a period of six months before complaint is made. The Commission is not authorized to extend its investigation to shipments made before that time; consequently, a finding that a rate is exorbitant or unusual at any given time is not a condemnation of such rate for any other time previous thereto. It needs no demonstration to comprehend that rates which may be entirely reasonable under existing conditions may become unreasonable when such conditions change. Neither can any presumption arise that any rate was unreasonable at any time preceding the period of investigation by the Commission merely because the Commission finds from such investigation that such rate is unusual or exorbitant. The difficulty of ascertaining. all the facts essential to a decision of the question for any length of time in the past, and the danger for this reason of again opening the door to the practice or rebating, doubtless influenced the legislature in limiting the scope of the investigation to such shipments as reached their destination within a period of six months, now one year, before complaint is made.

In *Andarko Cotton Oil Co. v. A. T. & S. F. R. Co.* 20 I. C. C. R. 43, 50, JUDGE CLEMENTS, speaking for the interstate commerce commission, says:

"In the matter before us it appears that some of the rates between many of the points involved were formerly higher than at present, and the situation here fairly illustrates what has taken place elsewhere in reductions from time to time in rates as the density of traffic increases with that of population and business development in a new and growing community. It would be a manifestly harsh rule that would assume a rate now condemned as unreasonable to have been so for a period of two years, or that of the statute of limitations, in the past as a basis for the payment of money by the carriers on past shipments, especially when no complaint had been made against them within that period. Certain it is that the law establishes no such presumption, nor is it a necessary sequence that the rate has been unreasonable for any period in the past. Neither does it seem that the bona fide action of the carriers in the necessary exercise of their judgment within reasonable limits should always be at their peril of liability for reparation for the difference between rates initiated upon their judgment and later changed upon the judgment of the Commission. Therefore the awarding of reparation by no means necessarily follows the reduction of a rate, whether by the voluntary action of the carriers or by order of the Commission."

Reference is made in the brief of counsel for the petitioner to ch. 271, Laws of 1909, and concerning this chapter it is said:

> "So by ch. 271, Laws of 1909, effective June 4, 1909, it was first provided that within thirty days from the passage of that act, complaint against any erroneous, unusual or exorbitant transportation, storage or demurrage charge on property delivered at destination, within five years immediately preceding July 12, 1907, the date of the passage of the first such act, might be made to the Commission, and if upon investigation the same was so found, the Commission should fix a reasonable rate and the carrier had a right to refund the excess. But it should be noted here that this last enactment contained no repealing clause whatever, and gave no right to the complaining party to sue for the recovery thereof. This course of legislation sought and was carefully designed to practically wipe out, without notice to the claimant, all rights of action to recover under our laws any unlawful excess or exorbitant charge made by carriers affecting property transported or stored, upon which destination delivery had been made subsequent to July 12, 1902, thus, if effective, destroying completely rights of action which, until the passage of the act of June 4, 1909, had a six year statute of limitations"

The history of the chapter mentioned may assist in fully appreciating the purpose of its enactment. When the Railroad Commission Act was passed in 1905, it contained no provision for making reparation upon past shipments of freight in case of an exorbitant or unusual rate being reduced by the Commission. So, in 1907, the legislature enacted sec. 1797—37m as an amendment to the original act of 1905. This amendment became effective July 12, 1907. Shortly thereafter several claims were filed with the Commission seeking reparation upon shipments which had been made prior to July 12, 1907, one of which dated back almost five years, and an adjustment thereof had been agreed upon by the shipper and the carrier, but actual refund had not been made when the act of 1905 took effect. The Commission decided that it was without jurisdiction to consider any claim for reparation which did not come within the scope of the amendment. There were in all five of such claims thus excluded. When the legislature convened in 1909, a bill was introduced at the instance of the claimants and the railroads against which such claims were pending. This bill, with but few changes, one of which was to shorten the time within which to file claims from six months to thirty days, passed and became ch. 271, Laws of 1909. When the bill was first up for consideration by the transportation committee of the assembly, it was opposed by a number of shippers and several carriers who were not interested in the particular claims, to enable the carriers to make lawful payment of which the bill was designed. The opposition was based upon the ground that it would afford an opportunity to carriers to discriminate against certain shippers and in favor of others, and therefore ought not to become a law. The committee being unanimously of the opinion that all past claims for refund against carriers on account of alleged excessive charges should be barred and the accounts of both carrier and shipper closed as to such transactions, reported the bill to the assembly for indefinite postponement. Subsequently, the shippers who were aggrieved succeeded in having the bill recommitted. As the merits of their claims could not be disputed, because the overcharges were the result of errors in the printing of tariffs, the committee finally modified the bill and reported it for passage. At the time sec. 1797—37m, passed in 1907, was regarded as a statute of limitations, and therefore the committee was cautious not to undertake to create any liability on the part of the railroads as to claims which might be barred by such section. The railroads were merely exempted from the penalty of the general statute if reparations were made by them upon the finding of the Commission. The claims were subsequently allowed and paid by the railroads upon the findings of the Commission, and the statute, by its terms, expired in thirty days after it became effective.

Turning now to the merits of the petition, we find that the same was filed on April 29, 1911, and that within a period of six months previous thereto the petitioner shipped twenty-two carloads of lumber products from Laona to Sheboygan, for which it paid the freight rate of 10 cts. per 100 lbs., three cars from Laona to Manitowoc, for which it paid the freight rate of 10 cts. per 100 lbs., and five cars from Laona to Milwaukee, for which it paid the freight rate of 11 cts. per 100 lbs. On Oct. 28, 1910, the petitioner complained to the Commission that the rates in effect between Laona and said points of destination were excessive and discriminatory when compared with the rates in effect from Wabeno to the same points. Prior to June 1, 1907, Wabeno was in the so-called Rhinelander group and the charges therefrom on lumber and lumber products to lake ports were in excess of those charged on the same products from the so-called Wausau group to the same points of destination. In

G. W. Jones Lbr. Co. v. C. & N. W. R. Co. 1 W. R. C. R. 520, an order was made placing Wabeno in the Wausau group. The question, although resolved in favor of the shipper, was regarded as close. That case, therefore, can not be regarded in and of itself as an authority for holding that the rates challenged in the instant case are exorbitant. Nevertheless, it appears that when the effect of competition began to be felt, the difference in rates between Wabeno and Laona could not be justified, and hence the railway company voluntarily reduced the rates from Laona to the points of destination mentioned, to the satisfaction of the shippers, and the proceedings before the Commission in that behalf were dismissed. Under the circumstances, we are satisfied that the rates charged the petitioner for shipment of lumber products made since Oct. 26, 1910, are unusual within the meaning of the statute. The rates now in effect are reasonably compensatory and should have been in effect at the time such shipments were made.

We therefore find and determine that the rates exacted of the petitioner by the respondent for the transportation of the aforesaid twenty-two carloads of lumber products are unusual, and that the reasonable rates for such service are those now in effect. The following schedule shows the shipments, amount of charges exacted, and the amount of charges that would have been exacted had the rates now in effect and applicable to such shipments been effective when the same moved:

LAONA TO SHEBOYGAN.

Car No.	Weight.	Rate.	Charge exacted.	Reasonable rate.	Charge.	Refund.
63192	43,300	10 cts.	$43 30	8½ cts.	$36 81	$6 49
43442	45,000	10	45 00	8½	38 25	6 75
63622	43,000	10	43 00	8½	36 55	6 45
580442	47,800	10	47 80	8½	40 43	7 37
34730	45,900	10	45 90	8½	39 02	6 88
15195	42,600	10	42 60	8½	36 21	6 39
11466	50,700	10	50 70	8½	43 10	7 60
42256	44,400	10	44 40	8½	37 74	6 66
64475	49,700	10	49 70	8½	42 25	7 45
19030	48,200	10	48 20	8½	40 97	7 23
19238	44,800	10	44 80	8½	38 08	6 72
19064	44,100	10	44 10	8½	37 49	6 61
71532	37,500	10	37 50	8½	31 88	5 62
63314	44,700	10	44 70	8½	38 00	6 70
81986	48,900	10	48 90	8½	41 57	7 33
7159	44,600	10	44 60	8½	37 91	6 69
77534	53,600	10	53 60	8½	45 56	8 04
14392	47,600	10	47 60	8½	40 46	7 14
7982	57,300	10	57 30	8½	48 71	8 59
2344	48,200	10	48 20	8½	40 97	7 23
12850	47,900	10	47 90	8½	40 72	7 18
3926	47,900	10	47 90	8½	40 72	7 18
	1,027,700	10	$1,027 70	8½	$873 40	$154 30

LAONA TO MANITOWOC.

Car No.	Weight.	Rate.	Charge exacted.	Reasonable rate.	Charge.	Refund.
49210	30,100	10 cts.	$30 10	8½ cts.	$25 59	$4 51
60508	30,700	10	30 70	8½	26 10	4 60
114340	56,700	10	56 70	8½	48 20	8 50
	117,500	10	$117 50	8½	$99 89	$17 61

LAONA TO MILWAUKEE.

Car No.	Weight.	Rate.	Charge exacted.	Reasonable rate.	Charge.	Refund.
12496	30,000	11 cts.	$33 00	10 cts.	$30 00	$3 00
22735	40,600	11	44 66	10	40 60	4 06
30519	50,600	11	55 66	10	50 60	5 06
22558	36,500	11	40 15	10	36 50	3 65
21104	38,600	11	42 46	10	38 60	3 86
	196,300	11	$215 93	10	$196 30	$19 63

Total amount of refund	$191 54

NOW, THEREFORE, IT IS ORDERED, That the the respondent, the Chicago & North Western Railway Company, refund to the petitioner, the Connor Land & Lumber Company, the said sum of $191.54.

INDEX-DIGEST

Every point taken by the Commission has been included in the INDEX-DIGEST, whether essential to the decision or not. Wherever feasible the exact language used by the Commission, both in the *dicta* and in the decisions, has been embodied in the digest, so that for practical purposes reference back to the decision will in most cases be unnecessary.

ABANDONMENT OF LINE OR PORTION THEREOF

See RAILROADS.

ACCOUNTING

COST ACCOUNTING—ELECTRIC UTILITIES.

Determination of unit costs—Apportionment of value of physical property among the different departments of the service.

1. In the present case the physical property has been apportioned between the several classes or branches of service. Some items are used by only a single service and may, therefore, be charged directly to that service. Other equipment is used in common by two or more branches of service, and the value of this equipment has been apportioned largely on the basis of the demands made upon the equipment in question by the several classes of service. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 372.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses—Further apportionment among the different departments of the service.

2. After the several utilities are each made to carry their proper share of the total burden, we are then confronted with the necessity of separating the costs of each utility among the several branches of service given by each utility. The electric utility furnishes energy to commercial lighting consumers, commercial power consumers, and public or street lighting. These separate branches of service have their peculiar characteristics of demand and use, and require more or less special equipment. In order, then, that the apportionments made necessary by the divisions of service, may be fair and equitably made and clearly understood, it is necessary to examine carefully into the operation of the plants and a large mass of operating data must be studied and in turn classified and adjusted to the proper basis. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R 187, 256–257.

3. It is, of course, a simple matter to determine what portion of the maximum demand on the station is made by the municipal contract lighting system. The demands of the commercial power and commercial lighing systems are not as readily ascertained, however. If the power consumers were all off-peak users, or, in other words, if all the

motors were stopped before the evening lighting load came on, then the evening demand would be chargeable entirely to commercial lighting. This is a condition, however, which is not found to exist, especially during the winter months when the lighting peak comes rather early. At such times the power load overlaps to some extent the lighting load and it would be distinctly unfair and inequitable to assess against the commercial lighting service a peak load which is, in fact, increased to a certain extent by the commercial power demand. A careful study of the daily load curves, covering particularly the contrast between the curves for Sundays and other days, the contrast between the curves for summer and winter months, and the drop in the curve at noon and at 5:00 p. m., would indicate what proportion of the maximum demand should be charged to the commercial power system. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 371.

Determination of unit costs—Prorating of output, capacity and consumer expenses.

4. The importance of a correct separation of the demand and output expenses is chiefly found in the fact that, in computing the costs per unit for rate-making purposes, that part of the expenses which depends upon the demand should be distributed over the demand or on the active load, while that part of the expenses which depends on the output should be distributed over the sales. In other words, from a theoretical point of view each consumer should contribute to the demand charges in proportion to his demand on the plant, and he should also share in the output expenses in proportion to the amount of current he uses. The two items together should make up the total amount he is charged for the services he receives. In actual practice, however, competitive and other conditions are frequently encountered under which rates so computed may require many modifications, if certain classes of customers are desired by the plants. (*State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 663.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 368.

5. Assuming that 50 per cent of the total connected load as reported in the present case is active, and dividing the total capacity expense by this active load, we obtain the capacity cost per year per kilowatt of active load. This amount divided by 365 gives the capacity cost per day. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 368–369.

6. The total output cost divided by the total current output for the year gives the cost per kw. hr. generated. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 369.

COST ACCOUNTING—GAS UTILITIES.

Determination of unit costs—Apportionment of value of physical property among different localities.

7. In the present instance it was necessary to apportion the entire property used in the gas business in the three cities. The apportionment was made upon the basis of gas sales in the respective cities during the year. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 479.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses.

8. Cases followed in the apportionment over output, capacity and consumer expenses: *State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 735–737, and *City of Racine v. Racine G. Lt. Co.* 1911, 6 W. R. C. R. 228, 304–309. Followed in *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 352.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses—Further apportionment among different departments of the service.

9. After the several utilities are each made to carry their proper share of the total burden, we are then confronted with the necessity of separating the costs of each utility among the several branches of service given by each utility. These separate branches of service have their peculiar characteristics of demand and use, and require more or less special equipment. In order, then, that the apportionments made necessary by the divisions of service, may be fair and equitably made and clearly understood, it is necessary to examine carefully into the operation of the plants and a large mass of operating data must be studied and in turn classified and adjusted to the proper basis. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256–257.

COST ACCOUNTING—JOINT UTILITIES.

Determination of unit cost—Apportionment of value of physical property among different plants—Office building—(Electric and gas utilities and electric railway.)

10. The only property used jointly by the different utilities is the office building. This property was apportioned on the basis of the space occupied for the different utilities. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 480.

Determination of unit costs—Apportionment of expenses among different plants—In general—(Electric, gas and water utilities.)

11. In the present case the respondent operates three utilities, namely, water, gas and electric. To ascertain the cost per unit of production for each utility, presents no simple problem. Each utility must stand on its own feet; gas consumers cannot be expected to carry any of the burdens of the water consumers; the water consumers, again, cannot be charged with part of the costs of the electric service. A large portion of the investment of the company, and a large part of the operating expenses of the plants, are directly chargeable to a particular utility and a particular class of service. The remaining investment and expenses are common to two or three utilities, and such equipment and costs must be apportioned between the utilities on a fair and reasonable basis. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256.

COST ACCOUNTING—RAILROADS.

Determination of unit costs—Apportionment of expenses among the different departments or branches of the service.

12. In determining the cost per unit of traffic the total expenses must be apportioned among the various branches of the service. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 182.

Determination of unit costs—Apportionment of expenses among the different departments or branches of the service—Further apportionment between terminal and movement expenses.

13. As the cost per unit of traffic is made up of the expenses of handling the traffic at the terminals and the expenses of moving it be-

tween the terminals, it is necessary to apportion the expenses for each branch between terminal and movement expenses. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 182.

14. In the present case the expenses of the petitioner per road-mile and per ton-mile are in general much lower than the expenses of the other roads of comparable size in the state for which data were available. A complete and accurate comparison of the expenses of the various roads would involve a separation of the expenses of each into movement and terminal expenses and the reduction of these two classes to unit expenses upon different bases. *In re Marathon County R. Co.* 1911, 7 W. R. C. R. 392, 397.

COST ACCOUNTING—TELEPHONE UTILITIES.

Determination of unit costs—Apportionment of expenses between toll and exchange—Apportionment among different exchanges—Apportionment between fixed and variable expenses.

15. In the case of telephone companies, as in other utilities, the expense may be divided into two groups, those varying with the amount of business done, or the variable expenses, and those which remain practically the same whatever the amount of business done, or the fixed expenses. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

Determination of unit costs—Apportionment of expenses between toll and exchange—Apportionment among the different exchanges—Apportionment between the fixed and variable expenses—Further apportionment among the different departments of the service.

16. The fixed expenses of the plant should be borne equally by all subscribers, since no one of them gets more benefit from the outlay than another. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

17. Such expenses as vary with the amount of business done by the plant are properly chargeable against subscribers in approximate proportion to the use of the plant made by each. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

COST ACCOUNTING—WATER UTILITIES.

Determination of unit costs—Apportionment of value of physical property among the different departments of the service.

18. The Commission has been called upon in several cases to determine the fair and equitable burden of expense of water works operation which should be borne by the public. Since the total costs upon which rates must be based include such items as taxes, depreciation, and interest on the investment, and since these expenses are directly proportional to the amount of the investment, it is at once evident that before distributing the costs between the several branches of service it is first necessary to apportion the total investment between services rendered. In water works operation the principal branches of service are public service, including fire protection, public buildings, flushing sewers, fountains, etc., and private and industrial services. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 310.

19. Cases followed in apportionment of investment between public use and private or domestic use: *City of Ashland v. Ashland W. Co.*

1909, 4 W. R. C. R. 273; *City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 66; and *Christian Dick et al. v. Madison W. Comm.* 1910, 5 W. R. C. R. 731, 757. Followed in *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 310.

20 Since fire service in the present case is responsible for approximately 48 per cent of the total investment in physical property in the water utility, then fire service must bear 48 per cent of the expenses which are directly dependent on the investment, namely, taxes, depreciation and interest on the investment. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 335.

21. In the present case 57.5 per cent of the plant value was made necessary by the fire service and 42.5 per cent by all other service. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

22. In the present case, the final apportionment of the existing value of the plant attributed 54 per cent to fire service and 46 per cent to general service. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 654.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses.

23. Actual operating expenses should be divided between output and capacity expenses, as repeatedly explained in previous decisions. In theory a third class should be made, of expenses which vary as the number of consumers and may be directly apportioned to consumers. In the present case, however, consumer expenses form such a small part of the total that nothing would be gained by separating them from the other expenses. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

Determination of unit costs—Apportionment of expenses over output, capacity, and consumer expenses—Further apportionment among different departments of the service.

24. After the several utilities are each made to carry their proper share of the total burden, we are then confronted with the necessity of separating the costs of each utility among the several branches of service given by each utility. In the water utility we find public service or fire protection as distinct from the domestic and industrial service. These separate branches of service have their peculiar characteristics of demand and use, and require more or less special equipment. In order, then, that the apportionments made necessary by the divisions of service, may be fair and equitably made and clearly understood, it is necessary to examine carefully into the operation of the plants and a large mass of operating data must be studied and in turn classified and adjusted to the proper basis. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256–257.

25. Capacity expenses, other than taxes, interest and depreciation, are apportioned upon the basis of the maximum demands. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

26. Output expenses, other than taxes, depreciation and interest, are apportioned upon the basis of the water used. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

27. Investigation by the engineering staff in the present case shows that 47 per cent of the maximum demand upon the pumping station may be exerted by the fire service and 53 per cent by all other service. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

28. As the fire service is supplied to only one consumer, it is not necessary to separate the items of taxes, depreciation and interest, as between output and capacity, but when we come to other classes of service this separation must be made. The basis for the separation is the result obtained by apportioning other expenses between output and

capacity; that is, percentages used are obtained from the summary of the apportionment of other items and are 55.1 per cent capacity and 44.9 per cent output in the present case. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 538–539..

29. The capacity expenses in the present case are apportioned on the basis of the demand on the pumping station. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 540–541.

30. Output expenses are apportioned between fire and general service on the basis of the amounts of water used by the two classes. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

31. Capacity expenses, or at least the greater part of them, are proportionate to the demands exerted by the fire and by the general service. There are some of the capacity expenses for which the demands may not be a strictly equitable basis of distribution as between the two classes of service. Among these expenses are street department labor, street department supplies and expenses, and maintenance of mains. These are not a large part of total expenses, however, and it seems best to distribute them on the demand basis rather than on some arbitrary basis which might be very far in error. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

32. In apportioning output and capacity expenses between the two classes of service, it is necessary to determine, as closely as possible, the output for each class of service and the demand which may be exercised by each class. Assuming that the maximum demands of the two classes of service will coincide, the fire demand has been found to constitute 44 per cent and the general demand 56 per cent of the total. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 652.

33. Since it is not practical to determine the ratio of demand exerted by fire or general service during the time of the peak, any apportionment based on the combined peak is very likely to be in error. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 652.

34. Although the apportionment based on the separate maximum demands may result in understating the amount properly to be charged to fire protection, this basis of apportionment appears to bring nearer the correct results than any other basis available. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 652.

Determination of unit costs—Apportionment of expenses over output, capacity, and consumer expenses—Further apportionment among different departments of the service—Depreciation.

35. Depreciation is apportioned throughout, both capacity and output expenses, upon the basis of the investment for the different branches of service. The same result would be obtained if depreciation were divided between the two classes of service before the apportionment to output and capacity was made. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

36. Depreciation should be apportioned between fire and general service on the basis of the division of plant value as between the two branches of service. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

Determination of unit costs—Apportionment of expenses over output, capacity, and consumer expenses—Further apportionment among different departments of the service—Interest.

37. Interest is apportioned throughout, both capacity and output ex-

penses, upon the basis of the investment for the different branches of service. The same result would be obtained if interest were divided between the two classes of service before the apportionment to output and capacity was made. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

38. Interest should be apportioned between fire and general service on the basis of the division of plant value as between the two branches of service. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

Determination of unit costs—Apportionment of expenses over output, capacity, and consumer expenses—Further apportionment among different departments of the service—Taxes.

39. Taxes are apportioned throughout, both capacity and output expenses, upon the basis of the investment for the different branches of service. The same result would be obtained if taxes were divided between the two classes of service before the apportionment to output and capacity was made. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 535.

40. Taxes should be apportioned between fire and general service on the basis of the division of plant value as between the two branches of service. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 651.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses—Further apportionment among different departments of the service—Apportionment of expenses among private consumers.

41. The apportionment of capacity expenses among the various consumers may best be made according to the size of service connection. Of course, it cannot be held that two consumers, both of whom are supplied with a ¾" service pipe, will, under all conditions, make the same demand upon the plant. Distance from the pumping station, elevation, size of supply mains, and length of service, all have their effect upon a consumer's possible demand. In practice, however, it is impossible to make rates which shall be modified by all of these factors, so that it seems that the best basis for a division of capacity expenses is that of the size of service. *In re Appl. Oconto City W. Supply Co* 1911, 7 W. R. C. R. 497, 561.

42. Objection may be made to the apportionment of expenses according to size of service connections on the ground that, even if all other conditions are identical, the actual demands of two consumers will not be determined entirely by the size of service connection, but are influenced to a considerable degree by the number and nature of fixtures supplied. That is, it may be argued that a consumer whose premises are supplied through a ¾" service pipe and a single faucet cannot make as large a demand as a consumer whose premises are supplied by a service pipe of the same size but with several faucets or fixtures supplied. It is undoubtedly true that the demands of two such consumers are not the same, and yet the size of service connection appears to be a reasonable basis. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 561.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses—Further apportionment among different departments of the service—Apportionment of expenses for private consumers as between metered and flat rate consumers—Apportionment of expenses among flat rate consumers.

43. If consumers are supplied on the flat rate plan, no accurate distribution of expenses as among consumers is practicable. In a general way, however, the rate per fixture takes account of the increased demand due to increased number of fixtures. As long as the flat rate plan is used, the rate schedule, therefore, takes cognizance of variation in demand caused by influences other than the size of service connection, as far as it is practicable to take these factors into consideration at all. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 561–562.

44. The apportionment of capacity expenses among the various consumers should be made, in general, upon the basis of the demand which each consumer can exercise. The principal factors influencing demand are the distance and elevation with reference to the pumping station, the size of mains, the size, condition, and length of service pipes, and the number of taps. If all consumers were in a position such that they could make a demand equal to the full carrying capacity of their service pipes, and if the pressure under which water was delivered from the mains to the services were equal in all cases, the demands of the various consumers would be proportional to the carrying capacity of their services. In the practical operation of a water utility, however, the demands will be found to vary greatly from any table of theoretical demands. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 661–662.

Determination of unit costs—Apportionment of expenses over output, capacity and consumer expenses—Further apportionment among different departments of the service—Apportionment of expenses for private consumers as between metered and flat rate consumers—Apportionment of expenses among metered consumers.

45. In fixing meter rates it seems best to consider the demand to be the demand of the service pipe, or, better still, of the meter itself. That is, the demand should be taken as the demand of a meter of the size in use, leaving the fixtures out of consideration. The company has to be ready to meet the greatest demand which may be made through the meter in use, and it seems that the demand expenses should be apportioned with this in view. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 562.

46. In order to determine what is the fixed expense per meter for various sizes, it seems best to assume that all consumers are being supplied through meter. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 662.

47. In the present case the reported cost of reading meters, is to be apportioned equally among the meters in use. The remaining expense incurred directly by metered consumers is to be apportioned among the various meters according to the value of the meters. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 663.

48. The meter reading cost is a consumer expense which should be divided equally among all metered consumers. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 663.

UNIFORM ACCOUNTS—ELECTRIC UTILITIES.

In general—Keeping of accounts—Conformity to Public Utilities Law required.

49. It appears that the accounts in the present case have not been kept in the form required by the law. *Held:* It is important that a system of accounts be kept which will show the condition of the plant at any time. The respondent is ordered to take immediate steps to conform with the Uniform Classification of Accounts prescribed by this Commission for water and electric utilities, and to adopt and install the necessary books and forms. *Electric Theater et al. v. Lodi El. Lt. Plant*, 1911, 7 W. R. C. R. 745, 754.

UNIFORM ACCOUNTS—JOINT UTILITIES.

Operating expense accounts—General expenses. (Electric, gas and water utilities.

50. The class of general expenses embraces such items as salaries of general officers, salaries of general office clerks, general office rent, general office supplies and expenses, miscellaneous general expenses, etc. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 282.

Operating expense accounts—Railroad Commission expenses. (Electric, gas and water utilities.)

51. The Railroad Commission expenses consist of legal expenses, the cost of expert witnesses, traveling and other expenses of officers of the company and others to and from the hearings, clerical salaries, miscellaneous supplies and expenses, and a proportion of the wages of regular employes of the company who were used in connection with the work for these proceedings. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 286.

52. That many expense items of this kind are of such character that they should be taken into account in the readjustment of the expenses for the purpose of this case, would seem to be fairly clear. At the same time it is also true that these costs require the same scrutiny as many other costs. The operating expenses in all such cases as the one now before us should include all legitimate and necessary outlays for the operation and the carrying on of the business of the plant, but no more than this. Furthermore, proceedings of the kind we are now dealing with are not of annual occurrence. In view of this fact it also seems that the greater part of the Commission expenses included should, for the purposes of this investigation, be distributed over more than one year. In fact, it would hardly be just to the consumers to include all such items in the costs upon which the rates for an indeterminate period in the future are based. (*State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 653.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 286–287.

UNIFORM ACCOUNTS—WATER UTILITIES.

Operating expense accounts—Railroad Commission expenses.

53. The most equitable method of dealing with Railroad Commission expenses is to distribute them over a series of years and allow a part of them to be treated as an operating expense each year. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 524.

54. Railroad Commission expenses should not be charged to a single year, or even to two or three years in which they were actually incurred, but should be apportioned over a number of years, inasmuch

as they are not expenses which will arise in the ordinary course of the business. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 645.

ACTIVE LOAD

As matter considered in making rates for electric utilities, *see* RATES, 8, 19.

ADVANCE IN RATES

See RATES.

ADVANTAGE

See DISCRIMINATION.

AGREEMENTS

See CONTRACTS.

AGRICULTURAL IMPLEMENTS

Refund on shipments, Milwaukee to Wisconsin points, *see* RATES, 61; REPARATION, 15.

ALLOWANCES

See REBATES OR CONCESSIONS.

Rebates or concessions, allowance to customer of water utility on account of ownership of instrument or facility, rate concession prohibited, *see* REBATES OR CONCESSIONS, 1–3.
Transit privileges, allowance of, *see* TRANSIT PRIVILEGES, 1.

APPORTIONMENT

- Apportionment of value of physical property among different plants
    - in the determination of unit costs,
        - for joint utilities, *see* ACCOUNTING, 10.
    - Further apportionment of value of physical property among different localities.
        - in the determination of unit costs,
            - for gas utilities, *see* ACCOUNTING, 7.
    - Further apportionment of value of physical property among different departments of the service.
        - in the determination of unit costs,
            - for electric utilities, *see* ACCOUNTING, 1.
            - for water utilities, *see* ACCOUNTING, 18–22.
- Apportionment of expenses among different plants.
    - in the determination of unit costs,
        - for joint utilities, *see* ACCOUNTING, 11.
    - Further apportionment among different departments or branches of the service. (Freight and passenger.)
        - in the determination of unit costs.
            - for railroads, *see* ACCOUNTING, 12–14.
                - Apportionment between terminal and movement expenses, *see* ACCOUNTING, 13–14.
    - Further apportionment among different departments or branches of the service. (Toll and exchange.)
        - in the determination of unit costs,
            - for telephone utilities, *see* ACCOUNTING, 15–17.
                - Apportionment among the different exchanges, *see* ACCOUNTING, 15–17.
                    - Apportionment among business, residence and rural, *see* ACCOUNTING, 16–17.

Apportionment of expenses over output, capacity and consumer expenses.
  in the determination of unit costs.
    for electric utilities, *see* Accounting, 2–3.
    for gas utilities, *see* Accounting, 8–9.
    for water utilities, *see* Accounting, 23–48.
 Further apportionment among the different departments of the service.
  in the determination of unit costs,
    for electric utilities, *see* Accounting, 2–3.
    for gas utilities, *see* Accounting, 9.
    for water utilities, *see* Accounting, 24–48.
      of depreciation, *see* Accounting, 35–36.
      of interest, *see* Accounting, 37–38.
      of taxes, *see* Accounting, 39–40.
     Apportionment among private consumers, *see* Accounting, 41–42.
     Apportionment of expenses for private consumers as between metered and flat rate consumers, *see* Accounting, 43–48.
      Apportionment among flat rate consumers, *see* Accounting, 43–44.
      Apportionment among metered consumers, *see* Accounting, 45–48.

APPRAISAL

Methods of appraisal of the property of public utilities, *see* Valuation, 49–54.

AUTOMATIC CROSSING ALARM

Installation of, *see* Railroads, 1–2, 5.

BILLS OF LADING

Force of the original bill of lading in determining the interstate or intrastate character of switching service, *see* Transportation, 1.

BLINDS

Rates, establishment of joint rates, Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to state line), *see* Rates, 42.

BRANCH LINE

Abandonment of line or portion thereof, *see* Railroads, 10, 11–12.
Operation of branch line, *see* Railroads, 11–12.
Power of Commission to order operation of branch line, *see* Railroad Commission, 6.

BRICK

Rates, reduction of distance tariff and establishment of joint rates, Wisconsin points, *see* Rates, 40–41.

BRIDGES

ESTABLISHMENT, CONSTRUCTION AND MAINTENANCE.

Toll Bridges—Repairs for safety and convenience of the public.

1. Petitioner alleges that the respondent operates a toll bridge over Sturgeon Bay, Wis., and prays that it be compelled to place the bridge

in good repair for the safety and convenience of the public. The charter of the respondent is for twenty-five years and expires within a short time, and the bridge will be turned over to the public. *Held:* The defects in the bridge should be remedied. The respondent is ordered to make the repairs as specified by the Commission within a period of 45 days. *City of Sturgeon Bay v. Sturgeon Bay Bridge Co.* 1911, 7 W. R. C. R. 727, 735–736.

BULK OF COMMODITIES

Bulk of commodities in relation to weight as element considered in making rates for railways, *see* RATES, 41, 43, 63.

CAPACITY COSTS

As element considered in making rates for electric utilities, *see* RATES, 2–9.

As element considered in making rates for water utilities, *see* RATES, 132–140.

CAPITAL STOCK

Requirement as to ownership of stock by telephone subscribers, *see* TELEPHONE UTILITIES, 14.

CAPITALIZATION

Capitalization of amount incurred through litigation as element considered in the determination of the value of property of public utilities, *see* VALUATION, 12.

CAR SERVICE

Adequacy of street car service, *see* STREET RAILWAYS, 4–5.

CAR SERVICE CHARGES

See DEMURRAGE CHARGES.

CARLOAD WEIGHTS

See WEIGHTS.

CARRIERS

CONTROL AND REGULATION OF COMMON CARRIERS.

Power of state to regulate charges, *see* RATES.

Power of state to regulate service and facilities, *see* RAILROADS; STREET RAILWAYS.

CARS

See RAILROADS; STREET RAILWAYS.

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

For change of line, by the M. St. P. & S. S. M. R. Co., *see* RAILROADS.

Application for, dismissed.

1. Application was made by the People's W. Lt. & P. Co. for a certificate of public convenience and necessity for the furnishing of water in the city of Mellen, Wis. Subsequent to the hearing, the parties interested in the controversy entered into an agreement whereby the Mellen W. & Lt. Co. conveyed its entire water distribution system

to the People's W. Lt. & P. Co. The agreement was ratified by the city. Since the matters in controversy have been settled there is no need for a certificate of public convenience and necessity, and the petition is dismissed. *In re Appl. People's W. Lt. & P. Co.* 1911, 7 W. R. C. R. 579, 580.

2. The C. St. P. M. & O. R. Co. prayed for a certificate of convenience and necessity authorizing it to construct a line of road from Black River Falls to Vaudreuil, Wis., a distance of one and eight-tenths miles. The petition was submitted on the evidence given in the case of *E. J. Vaudreuil Reality Co. v. C. St. P. M. & O. R. Co.* 1911, 6 W. R. C. R. 661. *Held:* There is not sufficient evidence before the Commission on which a certificate of public convenience and necessity could be granted. The petition is dismissed. *In re Appl. C. St. P. M. & O. R. Co.* 1911, 7 W. R. C. R. 741, 744.

Granted to the F. & N. E. R. Co.

3. Application was made by the F. & N. E. R. Co. for authority to construct a line of railroad from Fairchild, Eau Claire county, to Caryville, Dunn county, Wis. *Held:* The proposed line will serve a territory which is in need of railway facilities, and public convenience and necessity require the construction of the railway as proposed. Certificate is granted. *In re Appl. F. & N. E. R. Co.* 1911, 7 W. R. C. R. 755, 759.

CHANGE IN CLASSIFICATION

See CLASSIFICATION.

CHANGE IN TARIFFS

See SCHEDULES OR TARIFFS.

CHARGES

See DEMURRAGE CHARGES; MINIMUM CHARGES; RATES; TERMINAL CHARGES.

Transit privilege, charge for allowance of, *see* RATES, 68; TRANSIT PRIVILEGES, 1.

CITIES

See MUNICIPALITIES.

Power of cities to control their streets, highways and public places in respect to the use thereof by public service corporation, *see* STREET RAILWAYS, 1–2.

CLASS RATES

See RATES.

CLASSIFICATION

BASIS OF CLASSIFICATION

Cost of service as basis of classification in electric rates.

1. The rates for different classes of service or of consumers should recognize the cost of the service to these classes. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 367.

CLASSIFICATION IN TELEPHONE SERVICE.

Classification of subscribers.

2. The classification of telephone subscribers into residence and business subscribers, with higher rates for the latter than for the former, is lawful and permissible, not only from the point of view of the greater cost of providing the business service, but also because of the co-ordinate principle that a lower residence rate is necessary in order that a sufficiently large number of subscribers may be secured to

make the telephone valuable to business subscribers. (*In re Free and Reduced Rate Telephone Service*, 1908, 2 W. R. C. R. 521, 542.) *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

CLASSIFICATION SHEET

See Schedules or Tariffs.

COAL

Refund on shipment, Cudahy and South Milwaukee, from Milwaukee, Wis., *see* Rates, 64; Reparation, 14.

COKE

Refund on shipment, Cudahy and South Milwaukee from Milwaukee, Wis., *see* Rates, 64; Reparation, 14.

COMMERCIAL CONDITIONS

Commercial conditions as element considered in making railway rates, *see* Rates, 46.

COMMISSION

See Railroad Commission.

COMMODITIES

See various commodity subject headings.

COMMODITY RATES

See Rates; *also* various commodity subject headings.

COMMON CARRIERS

See Carriers.

COMPARISON OF RATES

Comparative data as element considered in making railway rates, *see* Rates, 47.

Comparative data as matter considered in determining reasonableness of railway rates. *See* Rates, 60, 62.

COMPENSATION

Compensation for property of public utilities in case of municipal acquisition, *see* Water Utilities, 6.

Compensation for property of public utilities in case of municipal acquisition, compensation to cover property used and useful, *see* Water Utilities, 6.

COMPETITION

Competitive conditions as element considered in making railway rates, *see* Rates, 46.

COMPLAINT

Contents of petitioner's complaint, Commission not limited by, in fixing reasonable rates, *see* Railroad Commission, 8.

COMPOSITE LIFE

Of telephone plant, *see* Depreciation, 6–7.

Of water plant, *see* Depreciation, 8–11.

CONCESSIONS

See Rebates or Concessions.

CONNECTED LOAD

As matter considered in making rates for electric utilities, *see* Rates, 8.

Ratio of active to connected load as matter considered in determining reasonableness of electric rates, *see* Rates, 19.

CONNECTING CARRIERS

Joint or through rates, *see* Rates, 38–44.

CONNECTING LINES

See Connecting Carriers.

CONNECTIONS

See Switch Connections.

CONSTITUTION

Franchises, subject to amendment or repeal by legislature under sec. 1, art. XI, of the state constitution, *see* Franchises, 1.

CONSTRUCTION OF STATUTES

Public Utilities Law, sections construed, *see* Public Utilities Law.

Railroad Law, sections construed, *see* Railroad Law.

CONSUMER CHARGES

See Minimum Charges.

CONSUMER COSTS

As element considered in making rates for electric utilities, *see* Rates, 2–9.

As element considered in making rates for water utilities, *see* Rates, 132–140.

Elements included in consumer costs for gas utilities.

1. In the present case the consumer expenses included items for labor, removing and resetting meters; meter and fittings department labor; customers' premises expenses; meter and fittings department supplies and expenses; maintenance of services; maintenance of meters; collection salaries and commissions; reading meters and delivering bills; collection supplies and expenses; uncollectible accounts. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 491.

CONSUMER EXPENSES

See Minimum Charges.

CONTINUANCE

See Procedure.

CONTRACT OF SHIPMENT

Character of shipment, whether intrastate or interstate, force of the original bill of lading in determining character of switching service, *see* Transportation, 1.

CONTRACTS

Agreement to enter into contract at future time.

1. It is elementary that the agreement to enter into a contract at some future time in order to be legally effective must be definite in all its terms and leave nothing for determination to future negotiations.

It must be certain in its provisions or capable of being rendered certain upon the happening of events which are not the result of future negotiations. *City of Green Bay v. Green Bay Tr. Co.* 1911, 7 W. R. C. R. 715, 723.

2. A contract between two persons upon a valid consideration, that they will, at some specified time in the future, at the election of one of them, enter into a particular contract, specifying its terms, is undoubtedly binding, and upon a breach thereof the party having the election or option may recover as damages what such particular contract, to be entered into, would have been worth to him, if made. But an agreement that they will in the future make such contract as they may then agree upon amounts to nothing. An agreement to enter into negotiations, and agree upon the terms of a contract, if they can, cannot be made the basis of a cause of action. There would be no way by which the court could determine what sort of a contract the negotiations would result in; no rule by which the court could ascertain whether any, or, if so, what damages might follow a refusal to enter into such future contract. So, to be enforceable, a contract to enter into a future contract must specify all its material and essential terms, and leave none to be agreed upon as the result of future negotiations. (*Shepard v. Carpenter*, 1893, 54 Minn. 153, 155–156.) (*Wills v. Carpenter*, 1891, 75 Md. 80.) (*St. Louis Railway Co. v. Gorman*, 1909, 100 Pac. 647.) (1 Page on Contracts, secs. 26, 27, 28.) (1 Beech on Contracts, secs. 75, 76, 77.) *City of Green Bay v. Green Bay Tr. Co.* 1911, 7 W. R. C. R. 715, 723.

CONVENIENCE AND NECESSITY

See CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

COST ACCOUNTING

See ACCOUNTING.

COST OF BUILDING UP THE BUSINESS

Net cost of building up the business, as element in the valuation of public utilities, *see* VALUATION, 6–21.

COST OF REPRODUCTION

Determination of the value of public utilities through their cost of reproduction new, *see* VALUATION, 27–41.

COST OF SERVICE

As element in making rates for electric utilities, *see* RATES, 1–9.
  for gas utilities, *see* RATES, 21–22.
  for railways, *see* RATES, 48–51.
  for water utilities, *see* RATES, 119–140.
As matter considered in determining reasonableness of electric rates, *see* RATES, 11–15.
  of gas rates, *see* RATES, 23–27.
  of railway rates, *see* RATES, 57–58.
  of telephone rates, *see* RATES, 78–80.
  of water rates, *see* RATES, 146–153.
Cost of service of electric utilities, *see* ACCOUNTING, 1–6, 10–11.
  of gas utilities, *see* ACCOUNTING, 7–9, 10–11.
  of railroads, *see* ACCOUNTING, 12–14.
  of telephone utilities, *see* ACCOUNTING, 15–17.
  of water utilities, *see* ACCOUNTING, 11, 18–48.

CRENOTHRIX

Valuation of water plant, depreciation due to crenothrix, as element in valuation, *see* VALUATION, 48.

CROSSINGS

See RAILROADS; STREET RAILWAYS.

CUT-OFF

Change of line and construction of cut-off, *see* RAILROADS, 10.

DEFINITIONS

See specific headings.

DEMURRAGE CHARGES

Refund of demurrage charge accrued through negligence of carrier, *see* REPARATION, 13.

DEPOTS

See STATION FACILITIES.

DEPRECIATION

Apportionment of depreciation in the determination of unit costs for water utilities, *see* ACCOUNTING, 35–36.
As element considered in making rates for electric utilities, *see* RATES, 10.
  for water utilities, *see* RATES, 125, 139.
As element in the valuation of public utilities, *see* VALUATION, 46–48.
As matter considered in determining reasonableness of rates for electric utilities, *see* RATES, 14.
  for gas utilities, *see* RATES, 26.
  for water utilities, *see* RATES, 149, 152, 155.
Depreciation due to crenothrix, as element in the valuation of water utilities, *see* VALUATION, 48.

RATE OF DEPRECIATION.

In general.

1. It is frequently assumed, and is strongly contended by the petitioner in this case, that the rate of depreciation is uniform, that is, that the decrease in value follows a straight line drawn between two points, namely, cost of reproduction and scrap value. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 235.

2. It seems fairly certain, in view of the facts, that if we are to consider the value of a unit of equipment as installed and in operation, the depreciation will in general occur more slowly during the earlier than during the later years of its life, and that in general the value at all times will be somewhat above the straight line drawn from cost of reproduction to scrap value. It is, however, much easier to arrive at this conclusion than it is to indicate the course actually followed by the decrease in value. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 236.

3. It is probable that the fairest representation of the course of depreciation is the sinking fund curve. Whether a 4 per cent, 3 per cent or other curve is the closest to a fair and reasonable rate depends largely upon other factors, which can perhaps be closely ascertained only by careful investigations and clear knowledge of the surrounding conditions. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 236.

4. There is, of course, no actual connection between the rate of depreciation of equipment and the rate at which money accumulates under a given rate of compound interest. The progress of depreciation must be assumed in any case. If we are to follow the proposition that it follows a curve instead of a straight line, it seems fair to as-

sume that this curved line has a certain general form, and it would seem reasonable to assume that the 4 per cent sinking fund curve fairly represents the progress of depreciation under average conditions. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 236.

5. Many appraisers oppose the use of a curve of any kind or form, and rely upon the judgment of an expert as based upon the actual inspection of the equipment under consideration. Since, however, a great deal of equipment cannot be adequately examined in service, it is necessary to rely very largely upon age, and in such cases the appraiser actually depreciates upon an actual or mental curve which is based upon the more or less definite life table which is the result of his experience. More consistent and fairer results would appear to be obtained by the use of a life table compiled from the experience of a large number of experts in connection with a definite curve, even if the basis for the use of such curve rests, to some extent, upon assumptions which are more or less difficult to justify with exactness. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 236–237.

Rate of depreciation of telephone plant:

6. Depreciation, as explained in previous decisions, may safely be fixed at about 7 per cent per annum in the case of telephone plants. *In re Appl. Ozaukee–Washington Tel. Co.* 1911, 7 W. R. C. R. 428, 433.

7. In general it may be said that a telephone plant depreciates at such a rate as to require a depreciation charge of at least 7 per cent of the value of the plant each year. *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 470.

Rate of depreciation of water plant.

8. Composite life computations of the water plant in the present case show that under the 4 per cent sinking fund method, the annual depreciation on the total property will be at about an annual rate of one-half of one per cent or less; under a 2 per cent sinking fund method the rate will be one per cent per annum or below this figure. (*Hill et al. v. Antigo Water Co.* 1909, 3 W. R. C. R. 623, 643.) (*In re Fond du Lac Water Co.* 1910, 5 W. R. C. R. 482, 502, 503.) *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 99.

9. It appears that an allowance for depreciation of approximately 2.2 per cent on the cost new of the depreciable property, or between 1.5 and 1.6 per cent per annum on the total property, as computed on the basis of a 2 per cent sinking fund, is ample. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 350.

10. According to the computations of the engineering staff, the composite life of the plant is 53.3 years. On a 4 per cent sinking fund basis the rate will be 0.565 per cent per year. On a 2 per cent sinking fund basis the annual rate would be about 1.07 per cent. Usually the 2 per cent sinking fund method of computing depreciation on water works property has been found best. *In re Oconto W. Supply Co.* 1911, 7 W. R. C. R. 497, 534.

11. The composite life of the water plant in the present case exclusive of services and meters, which are to be separately considered, is 56.21 years. If the 4 per cent sinking fund method of providing for depreciation is followed throughout, an annual rate of 0.496 per cent of the value of depreciable property would be sufficient to provide an adequate fund. On a straight line basis the rate would be 1.77 per cent. In practice it has been found best to make provision for depreciation at the rate of about 1 per cent. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 650.

DISADVANTAGE

See DISCRIMINATION.

DISCOUNTS

Discounts on bonds as element in the valuation of public utilities, *see* VALUATION, 30–31.

Discrimination due to discount provisions in utility rate schedules, *see* RATES, 160.

Regulations as to payment of rates for services rendered by public utility, provision for discounts, *see* RULES AND REGULATIONS, 3–5.

DISCRIMINATION

AS BETWEEN SUBSCRIBERS.

Telephone rates—Different rates for different classes of telephone service not necessarily unjust discrimination.

1. A disparity between rates which is based upon the cost of producing service is logical, and, in fact, no disparity at all. Cost of service is the best test of the reasonableness of rates, provided it is commercially feasible and otherwise equitable. (*Payne v. Wis. Tel. Co.* 1909, 4 W. R. C. R. 1, 58.) *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

Telephone rates—Different rates for stockholders and non-stockholders.

2. The practice of charging stockholders different rates than are charged to other users of the telephone service, is clearly illegal, and has been condemned in no uncertain terms by this Commission. (*In re Free and Reduced Rate Telephone Service*, 1908, 2 W. R. C. R. 521.) *In re Platteville, Rewey & Ellenboro Tel. Co.* 1911, 7 W. R. C. R. 608, 610.

Telephone rates—Different rates to subscribers on account of ownership of instruments or facilities.

3. The fact that stockholders own the instruments which they use does not furnish any reason for a difference in rates as between them and the non-stockholders. This principle is plainly stated in the law itself, which reads: "Sec. 1797m—90. It shall be unlawful for any public utility to demand, charge, collect or receive from any person, firm or corporation less compensation for any service rendered or to be rendered by said public utility in consideration of the furnishing by said person, firm or corporation of any part of the facilities incident thereto; provided nothing herein shall be construed as prohibiting any public utility from renting any facilities incident to the production, transmission, delivery or furnishing of heat, light, water or power or the conveyance of telephone messages and paying a reasonable rental therefor. * * * " What the rental to be paid to subscribers for the use of telephone equipment owned by them shall be, is a matter to be determined in the first instance by the telephone company itself and not by the Commission. Any injustice in this rental, as fixed by the company, may be made the subject of complaint to the Commission, the same as other practices of the company. But as to the rates themselves, there can be no question that all users of the same class of telephone service must pay the same amount. *In re Platteville, Rewey & Ellenboro Tel. Co.* 1911, 7 W. R. C. R. 608, 611.

DISSIMILAR SERVICES

Different telephone rates for dissimilar services, *see* RATES, 82–87.

DISTANCE TARIFF RATES

See RATES.

DIVISION OF JOINT RATES

See RATES.

DOORS

Rates, establishment of joint rates, Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to state line), *see* RATES, 42.

EFFICIENCY OF SERVICE

As element considered in making rates, *see* RATES, 128.

ELECTRIC RAILWAYS

See STREET RAILWAYS.

ELECTRIC RATES

See RATES.

ELECTRIC SIGNALS

Installation of, *see* RAILROADS, 1–2, 5.

ELECTRIC UTILITIES

Cost of service of electric utilities, determination of unit costs, *see* ACCOUNTING, 1–6, 10–11.

Minimum charges for electric utilities, *see* MINIMUM CHARGES, 1.

ACCOUNTING.

See ACCOUNTING.

OPERATION.

Requirements as to service and facilities—Appliances for the measurement of product or service—Duty of utility to provide meters.

1. It is the duty of the utility to put in meters unless exempted from so doing by the Commission. *Electric Theater et al. v. Lodi El. Lt. Plant*, 1911, 7 W. R. C. R. 745, 753–754.

Standards of service in particular cases.

2. Complaint was made by the City of Beloit that the electric service rendered by the Beloit W. G. & El. Co. was generally unsatisfactory and below the proper standard for such service. During the past few years the Commission has watched the service conditions in question. Three complete electric service inspections have been made, which show that, although in a few cases the voltage fluctuation has been outside the requirements, in general the voltage regulation is very satisfactory. These complete inspections have been supplemented by shorter inspections. All inspections indicate that the voltage regulation has been improved within the last two years, that the meters have been tested as required by the rules, and that the service has been very satisfactory. *Held:* On the whole the service conditions can now be said to be reasonably satisfactory and in conformity with the rules and regulations prescribed for utilities in this state. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 377, 380.

RATES.

See RATES.

VALUATION.

See VALUATION.

EMPTY CAR MILEAGE

As element considered in making railway rates, *see* Rates, 48.

ENGINEERING

Cost of engineering during construction as element in the valuation of public utilities, *see* Valuation, 32–34.

EQUIPMENT RENTAL

As matter considered in determining reasonableness of water rates, *see* Rates, 151–153.

What constitutes a reasonable rental for equipment owned by consumers, *see* Rates, 155–156.

EXORBITANT RATE

See Rates.

EXPENSES

Apportionment of expenses, *see* Accounting, 2–3, 8–9, 11, 12–14, 15–17, 23–48.

Prorating of expenses, *see* Accounting, 4–6.

EXTENSION SETS

Separate rates for telephone extension sets, *see* Rates, 88.

EXTENSIONS

Extension of water mains, *see* Water Utilities, 1–5.

Extension of water mains, adjustment of rates on extension of mains, *see* Rates, 94–101.

Extensions or additions to street railways, *see* Street Railways, 1–3.

FACILITIES FOR INTERCHANGE OF TRAFFIC

See Connecting Carriers.

FARES

See Rates.

FILING OF RATE SCHEDULES

See Schedules or Tariffs.

FILING OF SCHEDULES

See Schedules or Tariffs.

FIRE PROTECTION

Apportionment of expenses between fire and general service in the determination of unit costs for water utilities, *see* Accounting, 24–40.

Apportionment of value of property between fire and general service in the determination of unit costs for water utilities, *see* Accounting, 18–22.

FIXED EXPENSES

Apportionment of fixed or capacity expenses, *see* Accounting, 2–3, 8–9, 11, 15–17, 23–48.

Prorating of fixed or capacity expenses, *see* Accounting, 4–6.

FLAT RATES

Water rates, flat rates for water utility, *see* Rates, 107–116.

FOREST PRODUCTS

Rates, reasonableness of rates, Rib Lake from Spirit Falls and to Chelsea, Wis., *see* Rates, 65.

FRANCHISES

Acquisition of franchises or privileges by street railway companies, *see* Street Railways, 1–3.
Franchise value as element in the valuation of public utilities, *see* Valuation, 5.
Usurpation of franchise or exercise of unauthorized powers by a railway company, *see* Railroads, 13.

Franchise subject to amendment or repeal by legislature.

1. Objection was made in the present case to the jurisdiction of the Commission on the ground that the franchise granted the respondent was a contract and not merely a permit. This objection was overruled and the Commission assumed jurisdiction. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 631.

FREE HOUSE PIPING

As element in the valuation of public utilities, *see* Valuation, 39–40.

FREE OR REDUCED RATE SERVICE

Discrimination due to free or reduced rate service, *see* Discrimination, 2–3.

FREIGHT RATES

See Rates.

GAS RATES

See Rates.

GAS UTILITIES

Cost of service of gas utilities, determination of unit costs, *see* Accounting, 7–9, 10–11.
Minimum charges for gas utilities, *see* Minimum Charges, 2.

ACCOUNTING.

See Accounting.

OPERATION.

Standards of service in particular cases.

1. Complaint was made by the city of Beloit that the service rendered by the Beloit W. G. & El. Co. was generally unsatisfactory and below the proper standard for such service. During the past few years the Commission has watched the service conditions in question. Numerous inspections of the gas service conditions at Beloit show that the heat value has on all occasions been satisfactory, that the pressure regulation has been within the requirements, and that the meter testing has been carried on in a satisfactory manner. *Held:* On the whole, the service conditions can now be said to be reasonably satisfactory and in conformity with the rules and regulations prescribed for utilities in this state. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 377, 380.

RATES.

See Rates.

VALUATION.
See VALUATION.

GOING VALUE

As element in the valuation of public utilities, *see* VALUATION, 6–21.

GRADATION OF RATES

See RATES.

GRADE CROSSINGS

See RAILROADS.

GRAIN

Refund on shipment, Wisconsin points on the M. St. P. & S. S. M. R. Co. to Superior, Wis., *see* RATES, 66; REPARATION, 16.

HIGH GRADE FREIGHT

High rate for carriage of, *see* RATES, 59.

HIGHWAYS

Crossing by railroads, *see* RAILROADS, 1–9.

HYDRANT RENTAL

See RATES.
Hydrant rates, water actually used for fire protection through hydrants installed on private property to be paid for by city, *see* RATES, 103–106.

ILLUMINATED SIGN

Installation of, *see* RAILROADS, 1–2, 5.

IMPLEMENTS

See AGRICULTURAL IMPLEMENTS.

INDUSTRIAL TRACKS

See SWITCH CONNECTIONS.

INTANGIBLE VALUE

See VALUATION.

INTERCHANGE OF TRAFFIC

See CONNECTING CARRIERS.

INTEREST

Apportionment of interest in the determination of unit costs for water utilities, *see* ACCOUNTING, 37–38.
As element considered in making rates for electric utilities, *see* RATES, 10.
As element considered in making rates for water utilities, *see* RATES, 97, 100–101, 125, 139.
As matter considered in determining reasonableness of rates for electric utilities, *see* RATES, 14.
  for gas utilities, *see* RATES, 26, 30.
  for railways, *see* RATES, 57.
  for water utilities, *see* RATES, 149, 152, 155–157.
Interest during construction as element in the valuation of public utilities, *see* VALUATION, 32–34.
What constitutes a reasonable return for interest for public utilities, *see* RETURN, 1.

INTERSTATE COMMERCE

Jurisdiction of Commission over switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff, *see* Railroad Commission, 5.

Switching service, switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff, is not interstate commerce, *see* Transportation, 1.

What transportation is interstate and what intrastate, *see* Transportation, 1.

INTERSTATE TRANSPORTATION

See Transportation.

INTRASTATE TRANSPORTATION

See Transportation.

INVESTMENT

Return on investment, property employed in a public or quasi-public enterprise, owner entitled to reasonable return, *see* Return, 1.

JIMMY CARS

Relation to standard cars, *see* Rates, 60.

JOINT RATES

See Rates.

JURISDICTION

Commission, jurisdiction of, authority in awarding reparation, *see* Railroad Commission, 1.

Commission, jurisdiction of, authority over private industrial tracks, *see* Railroad Commission, 2.

Commission, jurisdiction of, how invoked under Railroad Law, *see* Railroad Commission, 4.

Commission, jurisdiction of, over service and facilities of railroad companies, switch connections for intrastate commerce, *see* Railroad Commission, 5.

Commission, jurisdiction of, over switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff, *see* Railroad Commission, 5.

Commission, jurisdiction of, power of Commission to order operation of branch line where carrier failed to comply with the statutory provisions relating to branches and extensions, *see* Railroad Commission, 6.

Commission, jurisdiction of, power of Commission to regulate rates, *see* Railroad Commission, 7, 8.

Commission, jurisdiction of, power of Commission to regulate rates, Commission not limited by contents of petitioner's complaint, *see* Railroad Commission, 8.

JUST COMPENSATION

See Compensation.

LAWFUL RATE

See Schedules or Tariffs.

LEGAL SERVICES

Legal services during construction as element in the valuation of public utilities, *see* Valuation, 32–34.

LIFE OF PUBLIC UTILITY PLANT

Of telephone plant, *see* Depreciation, 6–7.
Of water plant, *see* Depreciation, 8–11.

LIME

Refund on shipment, Oakfield to Hackley and Mountain, Wis., *see* Rates, 67; Reparation, 19.

LIMITATION OF STATUTE

Refund, claim for, barred by the limitations of the statute, *see* Reparation, 10–11.

LIVE STOCK

Rates, reasonableness of rates, Wisconsin points on the C. & N. W. R., *see* Rates, 68.
Transit privileges, restoration of privileges to shippers of live stock, Wisconsin points on the C. & N. W. R., *see* Transit Privileges, 1.

LOAD FACTOR

As matter considered in making rates for electric utilities, *see* Rates, 8, 19.

LOADING PER CAR

As element considered in making rates for railways, *see* Rates, 43.

LOCAL CONDITIONS

As element considered in making railway rates, *see* Rates, 35.

LOCAL RATES

See Rates.

LOGS

Refund on shipments, Marston Spur to Drummond, Wis., *see* Rates, 69; Reraration, 17.

LOW GRADE FREIGHT

Low rate for carriage of, *see* Rates, 59.

LUMBER

Refund on shipment, Ashland to Hayward, Wis., *see* Rates, 70; Reparation, 18.
  Goodman to Tomahawk, Wis., *see* Rates, 71; Reparation, 20.
  Laona to Wisconsin points, *see* Rates, 72; Reparation, 21.
  Stoughton, Wis., refund of demurrage charges, *see* Reparation, 13.

MAINS

Extension of water mains, *see* Water Utilities, 1–5.
Extension of water mains, adjustment of rates on extension of mains, *see* Rates, 94–101.

MAKING RATES

See RATES.

MANAGEMENT

Wages of management, as element in profits, *see* RETURN, 5–6.

MANAGING ABILITY

As element considered in making rates for water utilities, *see* RATES, 128–131.

MANUFACTURER'S RATES

See RATES.

MEASURED RATE

See RATES.

METER RATES

Water utility, meter rates for water utility, *see* RATES, 141–143.

METERS

As element in the valuation of public utilities, *see* VALUATION, 40.

Depreciation on meters as element included in consumer costs for electric utilities, *see* MINIMUM CHARGES, 1; RATES, 10.

Double meter system or two-rate system for gas discontinued, *see* RATES, 31.

Duty of public utility to provide meters, *see* ELECTRIC UTILITIES, 1; WATER UTILITIES, 8–14.

Electric meters, accuracy of, *see* ELECTRIC UTILITIES, 2.

Gas meters, accuracy of, *see* GAS UTILITIES, 1.

Installation of water meters in order to secure reliable basis upon which to collect rates, *see* RATES, 157–159.

Interest on meters, as element included in consumer costs for electric utilities, *see* MINIMUM CHARGES, 1; RATES, 10.

Maintenance of meters, as element included in consumer costs for gas utilities, *see* MINIMUM CHARGES, 2.

Maintenance of meters as element in fixing minimum charge for gas utilities, *see* MINIMUM CHARGES, 2.

Meter reading charges, as element in fixing minimum charge for gas utilities, *see* MINIMUM CHARGES, 2.

Meter rental, payment of reasonable rental by public utility to consumers furnishing their own meters, permitted under Public Utilities Law, *see* RATES, 151–153.

Payment of reasonable rental by public utility to consumers furnishing their own meters, permitted under Public Utility Law, *see* RATES, 151–153.

Reduction in rates on account of the furnishing of meter by consumer prohibited, *see* RATES, 151–153.

What constitutes a reasonable rental for meter owned by consumer, *see* RATES, 10.

MILLING IN TRANSIT RATES

See RATES.

MINIMUM CARLOAD WEIGHTS

See WEIGHTS.

MINIMUM CHARGES

ELECTRIC UTILITIES.

Determination of minimum charges.

1. In establishing a minimum bill for electric consumers the amount of the minimum depends on the costs of collection, interest and depreciation on meters, and other factors. As such a minimum is computed on the basis of expenses which include the interest and depreciation on all meters, justice to those consumers who own their meters requires that they should receive a rental from the utility sufficient to meet the fixed charges on this property. *Electric Theater et al v. Lodi El. Lt. Plant*, 1911, 7 W. R. C. R. 745, 753.

GAS UTILITIES

Determination of minimum charge.

2. In the present case the consumer expenses included items for labor, removing and resetting meters; meter and fittings department labor; customers' premises expenses; meter and fittings department supplies and expenses; maintenance of services; maintenance of meters; collection salaries and commissions; reading meters and delivering bills; collection supplies and expenses; uncollectible accounts. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 491.

MINIMUM LOADING REQUIREMENTS

See WEIGHTS.

MINIMUM WEIGHTS

See WEIGHTS.

MONOPOLY

Monopoly value as element in valuation, *see* VALUATION, 22.

MOVEMENT EXPENSES

Apportionment of movement expenses in the determination of unit costs of transportation, *see* ACCOUNTING, 13–14.

Movement expenses as element in making railway rates, *see* RATES, 51.

MUNICIPAL ACQUISITION OF PUBLIC UTILITIES

Compensation for property of public utilities in case of municipal acquisition, *see* WATER UTILITIES, 6.

MUNICIPALITIES

See CITIES; TOWNS; VILLAGES.

Police power of municipality, power of municipality to regulate location of poles within the streets or other public places, *see* TELEPHONE UTILITIES, 1–13.

Public utilities, municipal acquisition of, *see* WATER UTILITIES, 6.

Public utilities, municipal acquisition of, obligation of municipality to purchase property used and useful, *see* WATER UTILITIES, 6.

Telephone poles, power of municipality to regulate location of poles within the streets or other public places, *see* TELEPHONE UTILITIES, 1–13.

Water utilities, municipal acquisition of, *see* WATER UTILITIES, 6.

Water utilities, municipal acquisition of, obligation of municipality to purchase property used and useful, *see* WATER UTILITIES, 6.

NECESSITY

See CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

OPERATING EXPENSES

Operating expense accounts of electric utilities, *see* ACCOUNTING, 50–52.
  of gas utilities, *see* ACCOUNTING, 50–52.
  of water utilities, *see* ACCOUNTING, 50–54.

OPERATION OF TRAINS

See TRAIN SERVICE.

ORE

See ZINC ORE.

ORIGINAL COST

Original cost of physical property of public utilities as element in valuation, *see* VALUATION, 42–45.

OUTPUT COSTS

As element considered in making rates for electric utilities, *see* RATES, 2–9.

As element considered in making rates for water utilities, *see* RATES, 132–140.

OVERCHARGES

See REPARATION.

Overcharge for electric current due to error in meter reading, *see* RATES, 17.

PASSENGERS

Station accommodation, *see* STATION FACILITIES, 1–3.

PAVING

Allowance for cost of paving in the valuation of property of public utilities, when the cost was not actually incurred, *see* VALUATION, 27–29.

PAYMENT OF RATES

Regulations as to payment of rates for services rendered by public utilities, *see* RULES AND REGULATIONS, 2–6.

PENALTIES

Regulations as to payment of rates for services rendered by public utility, provision for penalties, *see* RULES AND REGULATIONS, 1, 3–5.

PETITION

Proceedings before Commission, rehearing upon original petition subsequent to vacation of order by court, *see* PROCEDURE, 3.

PHYSICAL PROPERTY

As element in the valuation of public utilities, *see* VALUATION, 23–48.

Determination of the value of physical property of public utilities, *see* VALUATION, 49.

PIECEMEAL CONSTRUCTION

As matter considered in the valuation of public utilities, *see* VALUATION, 35–36.

POLES

Telephone poles, power of municipality to regulate location of poles within the streets or other public places, *see* TELEPHONE UTILITIES, 1–13.

POLICE POWER

Police power of municipality, power of municipality to regulate location of poles within the streets or other public places, *see* TELEPHONE UTILITIES, 1–13.

POWER RATES

See RATES.

PRACTICE

See PROCEDURE.

PREFERENCE OR PREJUDICE

See DISCRIMINATION.

PRESENT VALUE

As element in the valuation of public utilities, *see* VALUATION, 46–48.

PRICES

Basis of unit prices in the valuation of property of public utilities, *see* VALUATION, 23–26.

PRIVATE SIDE TRACKS

See SWITCH CONNECTIONS.

PRIVILEGES

See TRANSIT PRIVILEGES.

PROCEDURE

PROCEEDINGS BEFORE COMMISSION.

Institution of proceedings, withdrawal of names prior to the hearing, leaving less than the required number, sufficiency of petition, question not decided, *see* RATES, 77.

Complaint against carrier for reparation.

1. According to the usual practice of the Commission the matter of refunds is determined in a separate proceeding based upon a formal petition therein. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461–462.

Decisions or orders of Commission.

2. Under both the law and practice no decisions are issued or orders made by this Commission except in formal proceedings. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 72.

Rehearing upon original petition, subsequent to vacation of order by court.

3. The present proceeding for a rehearing was instituted subsequent to the vacation of the original order of the Commission by the court. A new petition in the matter was filed in order to bring the matter properly before the Commission and to obviate any possible objection that might be interposed to the Commission's proceeding to rehear the matter upon the original petition in the absence of any express statutory enactment providing for such rehearing. *Eden Independent Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 140, 146.

PROFITS

What constitutes a reasonable return for profits for public utilities, *see* RETURN, 4-6.

PROPERTY RIGHTS

Property employed in public or quasi-public enterprises, owner entitled to reasonable return, *see* RETURN, 1.

PRORATING OF EXPENSES

Prorating of expenses in the determination of unit costs for electric utilities, *see* ACCOUNTING, 4-6.

PUBLIC CONVENIENCE AND NECESSITY

See CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

PUBLIC CONVENIENCE AND NECESSITY LAW

See RAILROAD LAW.

PUBLIC CORPORATIONS

See CITIES; MUNICIPALITIES; TOWNS; VILLAGES.

PUBLIC FRANCHISES

See FRANCHISES.

PUBLIC POLICY

Adjustment of railway rates to offset difference in cost of production, ordinarily contrary to public policy, *see* RATES, 73.

PUBLIC SERVICE CORPORATIONS

See ELECTRIC UTILITIES; GAS UTILITIES; RAILROADS; STREET RAILWAYS; TELEPHONE UTILITIES; WATER UTILITIES.

PUBLIC UTILITIES

See ELECTRIC UTILITIES; GAS UTILITIES; TELEPHONE UTILITIES; WATER UTILITIES.

PUBLIC UTILITIES LAW

SECTIONS CONSTRUED

Sec. 1778, municipality, power of, to regulate location of poles within the streets or other public places, *see* TELEPHONE UTILITIES.

Sec. 1778, telephone companies, right to conduct and maintain lines on public road or highway subject to reasonable regulation by municipality, *see* TELEPHONE UTILITIES.

Sec. 1797m—43, Commission, jurisdiction of, how invoked under Public Utilities Law, *see* RAILROAD COMMISSION.

Sec. 1797m—90, rates, telephone, difference in rates as between stockholders and non-stockholders on account of ownership of instruments or facilities prohibited, *see* DISCRIMINATION.

Sec. 1797m—90, rates, telephone, reduction of, on account of the furnishing of instruments or facilities by subscriber prohibited, *see* RATES.

Sec. 1797m—90, rebates or concessions, allowance to subscriber of telephone utility on account of ownership of instruments or facilities, rate concessions prohibited, *see* REBATES OR CONCESSIONS.

PUBLICATION OF RATE SCHEDULES

See SCHEDULES OR TARIFFS.

PUBLISHED RATE

Departure from, prohibited, *see* SCHEDULES OR TARIFFS, 3–4.

PURPOSE OF LAW

See PUBLIC UTILITIES LAW; RAILROAD LAW.

RAILROAD COMMISSION

Authority of Commission in awarding reparation.

1. The jurisdiction of the Commission in reparation cases being limited to a six months' period, it cannot investigate the reasonableness of the charges made at any time previous. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778, 779.

Authority of Commission over private industrial tracks.

2. In the original order of the Commission (4 W. R. C. R. 233, as modified in 4 W. R. C. R. 788 and 5 W. R. C. R. 110), subsequently vacated by the supreme court (144 Wis. 523), the Commission acted on the basis that private tracks laid upon the premises of a private company for the convenient operation of its industries do not form a part of the railway company's system. If we are in error in this and the Commission has authority to thus extend private tracks, constructed upon the premises of industries for the purpose of conveniently handling the in and out traffic of such industries, it is important that the matter be not left in doubt. From the language of the court it would seem that such authority exists, but as we are unable to find that the attention of the court was directed to the question here suggested, we hesitate to accept the conclusions reached as final, and trust, if the matter should again reach the supreme court for decision, that the question may be positively determined. *Eden Independent Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 140, 147.

Decisions or orders of Commission.

3. Under both the law and the practice no decisions are issued or orders made by the Commission except in formal proceedings. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 72.

Jurisdiction of Commission—How invoked under Railroad Commission Law.

4. The respondent contends that, as the petitioner is not a mercantile, agricultural or manufacturing society, it cannot invoke the jurisdiction of the Commission in the proceedings here instituted. This objection is not tenable, for the reason that sec. 1797—12 provides that the Commission may take jurisdiction of the matters herein complained of "upon complaint of any person, firm, corporation or association, or of any mercantile, agricultural or manufacturing society, or of any body politic or municipal organization." The objection seems to be based upon the provisions of sec. 1797m—43 of the Public Utilities Law, which has no application here. *Washington Park Adv. Assn. v. T. M. E. R. & L. Co.* 1911, 7 W. R. C. R. 19, 20.

Jurisdiction over switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff.

5. In *Duluth-Superior Milling Co. et al. v. N. P. R. Co.* 1910, 6 W. R. C. R. 70, the Commission considered the question of its jurisdiction

over the switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff. It was held that the service in question was an intra-state transaction and therefore within the jurisdiction of the Commission. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461.

Power of Commission to order operation of branch line where the carrier has failed to comply with the statutory provisions relating to branches and extensions.

6. The contention of the railway company that it is not legally obliged to operate the branch road in question as a common carrier, even if the facts would justify an order to that effect by the Commission, because the company failed to comply with the statutory provision (St. of 1898, sec. 1831) in building the branch is not tenable. Perhaps the only answer to the contention of the company is that the statute was enacted for the benefit of the public and not for the benefit of the railroad corporations, and, therefore, the public alone can complain of its violation. The company has not relieved itself of any duty which it owed to the public as a common carrier, by neglecting to take the preliminary steps provided for by statute. It is not in any position to claim immunity by reason of its failure to do what it should have done before building the extension in question (*Rib Lake Land Co. v. Upham Mfg. Co.* 1909, 1 W. R. C. R. 739, 766), and it can be compelled to operate this line, even though its board of directors failed to pass a resolution making the branch a part of its system under sec. 1831 of the Statutes. *Meyer v. Rib Lake Lbr. Co. et al.* 1911, 7 W. R. C. R. 401, 406–407.

Power of Commission to regulate rates.

7. The only remedy provided for altering rates, when found by the Commission to be unjust and unreasonable, is that prescribed by the statute. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

Power of Commission to regulate rates—Commission not limited by contents of complaint.

8. The jurisdiction of the Commission was challenged as to such of the rates fixed by it as were lower than those asked for by the petitioners. This objection may be disposed of briefly by calling attention to the fact that the petitioners suggested in their petition that the rates to be fixed by the Commission "should not exceed" certain rates named; also that the statute (section 1797—12) empowers the Commission, upon finding, after complaint and investigation, that the rates complained of are unreasonable, "to fix and order substituted therefor such rate or rates as it shall have determined to be just and reasonable." The Commission is thus not bound by the suggestions of the petitioners, but is free to establish what it considers to be reasonable rates under the circumstances of the case. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 599–600

RAILROAD COMMISSION ACT

See Railroad Law.

RAILROAD COMMISSION LAW

See Railroad Law.

RAILROAD CONSTRUCTION

See CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

RAILROAD CROSSINGS

Protection of crossings, *see* RAILROADS, 1-9.

RAILROAD EXTENSIONS

See CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY.

RAILROAD LAW

CONSTRUCTION OF LAW

With respect to common law rights.

1. The act of 1905 (Railroad Commission Act, Laws 1905, ch. 362) superseded the common law. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

2. Amendment sec. 1797—37m to the Railroad Commission Act is not merely remedial in its character, nor does it merely give a remedy for an existing right. It confers the right and provides the remedy to enforce it. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

SECTIONS CONSTRUED

Sec. 1797—1 to 1797—38 (ch. 362, Laws of 1905), Railroad Commission Law, superseded the common law, *see* RAILROAD LAW.

Sec. 1797—6, rates, railway, manufacturers' rates, lower freight rates for manufacturers than for the general public authorized, *see* RATES.

Sec. 1797—12, Commission, jurisdiction of, how invoked under Railroad Commission Law, *see* RAILROAD COMMISSION.

Sec. 1797—12, rates, railway, power of Commission to regulate rates, *see* RATES.

Sec. 1797—12, rates, railway, power of Commission to regulate rates, Commission not limited by contents of petitioner's complaint, *see* RAILROAD COMMISSION.

Sec. 1797—12a (ch. 271, Laws of 1907), reparation, period of limitation, *see* REPARATION.

Sec. 1797—37m, Railroad Commission, authority of, in awarding reparation, *see* RAILROAD COMMISSION.

Sec. 1797—37m, reparation, authority of Commission in awarding reparation, *see* REPARATION.

Sec. 1797—37m, Railroad Commission Law superseded the common law, *see* RAILROAD LAW; REPARATION.

Sec. 1797—37m, reparation, limitation of the statute, jurisdiction of courts in cases involving overcharges upon which the limitation of the statute has run, *see* REPARATION.

Sec. 1797—37m (ch. 582, Laws of 1907), reparation, period of limitation, *see* REPARATION.

Sec. 1831, railway branches and extensions, operation of branch as common carrier, company under obligation to operate regardless of failure of directors to take preliminary steps provided by statute, *see* RAILROAD COMMISSION; RAILROADS.

Sec. 1831, railway branches and extensions, operation, duty to operate, company not in position to claim immunity on account of noncompliance with preliminary steps provided by statute, *see* RAILROAD COMMISSION; RAILROADS.

Sec. 1832, railroads, change of line, construction of cut-off and abandonment of old line, *see* RAILROADS.

RAILROADS

See CARRIERS; CONNECTING CARRIERS; STREET RAILWAYS.

ACCOUNTING.

See ACCOUNTING.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT.

Crossings—Protection of.

1. The town of Wauwatosa prays that the C. & N. W. R. Co. be ordered to provide adequate means of protection either by gates, electric signals or other suitable device at the Potter avenue crossing in the town of Wauwatosa, Wis. *Held:* Conditions at this point do not require a flagman or gates for protection at the present time. Respondent is ordered to install an automatic audible alarm, with an illuminated sign in addition. Sixty days is deemed a reasonable time within which to comply with this order. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 451, 452.

2. The town of Wauwatosa prays that the C. & N. W. R. Co. be ordered to provide adequate means of protection either by gates, electric signals or other suitable device at its Burleigh street crossing in Wauwatosa, Wis. *Held:* Conditions at this point do not require a flagman or gates for protection at the present time. Respondent is ordered to install an automatic audible alarm, with an illuminated sign in addition. Sixty days is deemed a reasonable time within which to comply with this order. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 453, 454.

3. The town of Wauwatosa prays that the C. & N. W. R. Co. be ordered to construct a temporary highway at the intersection of its Milwaukee-Sparta extension with the North Town Line road in Wauwatosa, Wis., and to provide such mode and manner of crossing as may be determined upon by the Commission. The respondent intends to construct a regular yard system at this point and to construct eight to ten switching tracks over the highway in addition to the two main tracks. The location of the yards at this point is causing a village to be built up which will greatly increase the amount of traffic on the highway, and a grade crossing would be dangerous to travel. *Held:* An overhead crossing would eliminate all danger to vehicular and pedestrian traffic, and would be of great economic value to the railway company in the operation of its through trains and general switching. The respondent is ordered to construct and maintain an overhead crossing at the point in question. The approach is not to exceed a 5 per cent grade. Plans of the structure are to be submitted to the Commission for approval. Six months is deemed a reasonable time within which to comply with this order. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 457, 458.

4. Petitioner prayed for the removal of two bridge piers constructed in the highway by the C. & N. W. R. Co. in making an overhead crossing over the Watertown plank road in the town of Wauwatosa, Milwaukee Co., Wis., for the reason that they narrowed the roadway, obstructed the view, and interfered with the natural drainage. *Held:* Conditions do not warrant change in construction. The petition is dismissed. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 621, 623–624.

5. Petitioner prays for proper protection at the crossing of the C. & N. W. R. Co. at the intersection of its Milwaukee-Sparta extension with Lisbon avenue in the town of Wauwatosa, Milwaukee Co., Wis. *Held:* Some protection is necessary at this crossing. Respondent is ordered to install an automatic audible alarm with illuminated sign and to

construct and maintain the crossing at a width of 32 feet. Sixty days is deemed a reasonable time within which to comply with this order. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 625, 627.

Crossings—Restoration and maintenance of highway.

6. Petitioner prays that the C. & N. W. R. Co. be required to restore the highway at the intersection of its Milwaukee-Sparta extension with North avenue in the town of Wauwatosa, Milwaukee Co., Wis. to a condition of usefulness. *Held:* The construction of the bridge and the other improvements as planned by respondent will be sufficient for traffic which may reasonably be expected over this crossing for some time to come. It is ordered that the respondent construct and maintain a bridge in accordance with the plans and specifications submitted; reduce the grade to the bridge approaches to not more than 6 per cent, and restore the drainage of the highway and adjoining property; make necessary fillings where the approaches intersect existing highways, and construct a proper passageway from the approach to adjoining school grounds. Four months is deemed a reasonable time within which to comply with these orders. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 709, 713–714.

Crossings—Separation of grades.

7. Petitioner alleges that in the construction of an overhead crossing at the intersection of its Milwaukee–Sparta extension with the South Town Line road in the town of Wauwatosa, Milwaukee Co., Wis., the C. & N. W. R. Co., in building its abutments, has encroached on the highway, interfered with the natural drainage, and has not provided sufficient headway or sufficient width for the subway. *Held:* The width of the subway is sufficient to take care of much heavier travel than that which may reasonably be expected at this point for a number of years. The respondent is ordered to depress the highway so as to increase the headway to fifteen feet; to lengthen the highway that it shall not exceed a 6 per cent grade; and to construct a culvert to take care of the drainage. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 737, 738–739.

8. Complaint was made that the existing trestle over the tracks of the C. & N. W. R. Co. at the intersection of its Milwaukee-Sparta extension with Blue Mounds road in the town of Wauwatosa, Milwaukee Co., Wis., is inadequate. Petitioner prays that the respondent be required to construct a trestle of a permanent nature; to build adequate and safe approaches the full width of the highway; and to provide proper drainage. *Held:* It appears that the bridge and approaches, when finally completed in accordance with the plans of the respondent, will fully meet the requirements of the traveling public. Petition is dismissed. *Town of Wauwatosa v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 760, 763.

Crossings—Separation of grades—Subway.

9. The city of West Allis alleges that the grade crossing of National avenue with the C. & N. W. R. is dangerous. The street is heavily traveled and is crossed by the belt railroad now under construction around the city of Milwaukee. The respondent submitted to the city plans for changing the street and agreed to perform the necessary work. The common council authorized the petition to the Commission for an order granting the right to make the proposed change. Petitioner prays that the grade crossing be closed and discontinued, and that a new street be laid out along the north of respondent's right of way to a subway to be constructed, adjoining the subway of Wauwatosa avenue. *Held:* The grade crossing is dangerous. Respondent is ordered to abandon the present crossing and to construct the new high-

way and subway according to plans to be submitted to the Commission for approval. Six months is deemed a reasonable time within which to comply with this order. *City of West Allis v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 493, 496.

CONTROL AND REGULATION IN GENERAL.

Determination as to necessity for railroad.

See CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY.

LOCATION OF ROAD, TERMINI AND STATIONS.

Change of line—Construction of cut-off and abandonment of old line.

10. Petitioner alleges that the respondent, in the construction of a cut-off, had moved its line one and one-half miles from the unincorporated village of Albertville, Chippewa Co., Wis. *Held:* Since the respondent had taken the proper statutory proceedings under sec. 1832, and had obtained a certificate of public convenience and necessity, it had full authority to construct the new line and abandon the line through Albertville. The Commission is without jurisdiction to entertain the petition. *Hart et al. v. M. St. P. & S. S. M. R. Co.* 1911, 7 W. R. C. R. 463, 464.

OPERATION.

Duty to operate—Abandonment of road or portion thereof.

11. A petition was filed by the respondent railway company for a rehearing on an order issued by the Commission requiring the operation, as a common carrier, of a line of railway between Rib Lake and Spirit Falls, Wis. (*Meyer v. Rib Lake Lbr. Co. et al.* 1909, 4 W. R. C. R. 178). The issue was raised whether under the law the Commission has the power to compel respondents to operate the branch road in question as a common carrier, conceding that the facts in the situation presented would justify such an order. It is the contention of the railway company that it does not matter what steps it may have taken with a view of operating the branch line as a common carrier, it cannot be compelled to do so because of its failure to comply with the provisions of sec. 1831 of the statutes relating to branches and extensions. *Held:* The company has not relieved itself of any duty which it owed to the public as a common carrier, by neglecting to take the preliminary steps provided for by statute. It is not in any position to claim immunity by reason of its failure to do what it should have done (*Rib Lake Land Co. v. Upham Mfg. Co.* 1907, 1 W. R. C. R. 739, 766), and it can be compelled to operate the line in question even though its board of directors failed to pass a resolution making the branch a part of its system under sec. 1831 of the Statutes. It is ordered, that the respondent, Wis. C. R. Co., and its successor, the M. St. P. & S. S. M. R. Co., operate not less than one train on one day in each week between Rib Lake and Spirit Falls. Proper and sufficient notice of the place and time of arrival and departure of such train is to be given according to law. *Meyer v. Rib Lake Lbr. Co. et al.* 1911, 7 W. R. C. R. 401, 407, 425.

12. A petition was filed by the respondent railway company for a rehearing on an order issued by the Commission requiring the operation as a common carrier of a line of railway between Rib Lake and Spirit Falls, Wis. (*Meyer v. Rib Lake Lbr. Co. et al* 1909, 4 W. R. C. R. 178). The question whether the amount of the products available for shipment will be sufficient to justify the investment required to put the branch in operating condition, and the further cost of operating the trains was deemed material by the parties, and conflicting estimates were offered to sustain the contention of the parties respectively.

It appears that there is a vast amount of timber tributary to the branch. *Held:* While the branch in question may not be a paying proposition at present, it is an integral part of the railway system and cannot be abandoned because it does not pay, so long as the operating revenues of the entire system are adequate to meet all requirements. *Meyer v. Rib Lake Lbr. Co. et al.* 1911, 7 W. R. C. R. 401, 407-408, 410, 425.

Duty to operate—Operation at pecuniary loss.

See ante, 12.

Requirements as to service and facilities.

See STATION FACILITIES.

RAILROAD COMPANIES.

Franchises and powers—Usurpation of franchise or exercise of unauthorized powers.

13. A corporation usurping a franchise may be restrained from its exercise in an action brought on behalf of the state. *Meyer v. Rib Lake Lbr. Co. et al.* 1911, 7 W. R. C. R. 401, 407.

RATES.

See RATES.

VALUATION.

See VALUATION.

RATE ADJUSTMENT

See RATES.

RATE SCHEDULES

See SCHEDULES OR TARIFFS.

RATES—ELECTRIC

See also MINIMUM CHARGES.

Making rates—Elements considered—Cost of service—Economies in operation.

1. It is expected, and is quite generally found to be the fact, that in combined plants the rates of general expenses or management costs will be less than in the case of single utilities or plants operating a water, gas, electric, or electric railway property alone. A combination of utilities, such as this case presents, may offer many opportunities for economies not possible in a single utility. Where such economies are made possible, it would appear that while the public is entitled to some share in such benefits as may result from such economies, at the same time the company is entitled to a reward for effecting the results described. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 285.

Making rates—Elements considered—Cost of service—Output, capacity and consumer costs.

2. Rate schedules, which are based exclusively on other considerations than the cost of the service to the plant, are not only likely to be inequitable as between the different classes of consumers, but they are also apt to retard the proper development of the business of the plant. That this is the case, can readily be shown. For instance, we may assume a case where the consumers for some reason may desire to use the current a greater number of hours per day than they have been

using it in the past. This would increase the output of the plant without at the same time increasing the maximum demand upon it. An increase of this character would not require any increase in the capacity of the plant and would therefore not affect the fixed expenses. (*In re Menominee & Marinette Lt. and Tr. Co.* 1909, 3 W. R. C. R. 778, 827.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 366–367.

3. Since increasing plant operation through daily long-hour consumption reduces the fixed expense per unit, it becomes apparent how important it is for both the management and subscribers that the plant become loaded with such business as will bring about a reduction in the unit cost, and that the rate schedule be so framed as to recognize the cost of service. (*City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 34.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 367.

4. With the maximum demand remaining the same, the cost to the plant per unit of current decreases with increases in hours used, and increases with decreases in the hours used. In view of this it would also seem that there should be corresponding changes in the prices at which the current is sold. Unless under conditions of this character prices change with changes in the cost, some among the consumers are likely to have to contribute more than their share of the income of the plant. Unless in such cases prices are adjusted to the cost, it also becomes very difficult, if not impossible, to extend the use of the current. Since, as shown, the cost per unit gradually grows less as the use of current is increased, any failure to develop the business of the plant to the fullest extent possible is almost certain to result both in lower profits to the plant and in higher rates to the consumers. (*In re Menominee and Marinette Lt. & Tr. Co.* 1909, 3 W. R. C. R. 778, 828.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 367.

5. In the electric utility business rates must, to a large extent, be founded on costs. These costs are of two kinds, fixed and variable. The rates for different classes of service or of consumers should recognize the cost of the service to these classes. Increasing production brings decreasing unit costs, and lowest unit costs can only be secured through the best possible development of the business and through the best possible adjustment of the rates to meet the expenses and character of service demanded by the several classes of consumers. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 367.

6. In the present case the hydraulic generation has its influence in reducing the percentage of output expenses below what this percentage would be were the current generated entirely by steam power. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 368.

7. Since increasing plant operation through daily long-hour consumption reduces the fixed expense per unit, it becomes apparent how important it is for both the management and subscribers that a plant become loaded with such business as will bring about a reduction in the unit cost, and that the rate schedule be so framed as to recognize the cost of service. (*City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 34.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 369.

8. The ratio of active connected load or demand to full connected load is an important consideration in determining upon the fair rate schedule. (*City of Manitowoc v. Manitowoc El. Lt. Co.* 1910, 5 W. R. C. R. 360, 384.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 376.

9. The cost per unit to a plant for furnishing current is greatly affected by the maximum demand on the plant and by the length of time the current is used each day. A high and fluctuating demand and a short time of daily use of the current stands for a relatively high cost per unit. Low or steady demands and long hours use of current stands for relatively low cost per unit. Where there are considerable varia-

tions in the demand and the length of time the current is used. a uniform rate is, therefore, likely to be discriminatory between the different customers. Where, on the other hand, there are comparatively small variations as between the customers in the demand and in the hours daily use of the current, a uniform rate may not be unfair. (*In re Appl. Darlington El. Lt. & W. P. Co.* 1910, 5 W. R. C. R. 397, 414.) *Electric Theater et al. v. Lodi El. Lt. Plant,* 1911, 7 W. R. C. R. 745, 752.

Minimum rates.

10. In establishing a minimum bill for electric consumers the amount of the minimum depends on the costs of collection, interest and depreciation on meters, and other factors. As such a minimum is computed on the basis of expenses which include the interest and depreciation on all meters, justice to those consumers who own their meters requires that they should receive a rental from the utility sufficient to meet the fixed charges on this property. *Electric Theater et al. v. Lodi El. Lt. Plant,* 1911, 7 W. R. C. R. 745, 753.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service.

11. The most important factor in determining the rate of charge is the cost of service. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256.

12. Rates for the services rendered by public utilities should very largely be based upon the cost to the plants of furnishing the services. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

13. Cost of service is not the only element upon which reasonable rates depend, but in most cases it is the most important element. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

14. Cost of service includes not only the ordinary expenses of operation of the plant, but also includes the items of taxes, depreciation, and interest and profit on investment. Since rates must be controlled largely by the cost and several of the principal elements of cost are immediately affected and determined by the investment, it is at once apparent that the determination of reasonable rates is largely a matter of investigation of the operating expenses and the investment. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

15. Reasonable rates can only be based upon normal and reasonable cost of service, which means that the operating expenses and the investment should be normal and not excessive, in view of the conditions under which the utility must be operated. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 288.

Reasonableness of rates—Matters considered in determining reasonableness—Relation between investment and growth of business.

16. In determining the reasonableness of rates careful inquiries should be directed to determine the relation between the investment line and the growth of business line at the particular period or year upon which the determination of the cost of service and, therefore, the rates are to be determined. For it is evident from these considerations that if the rates are computed upon the return on an investment which is taken at a point where the investment line is considerably above the business line, that, what appear to be reasonable rates at that point, may prove to be unreasonable and excessive at a point several years further on. Or, on the other hand, what may appear to be reasonable rates when the investment line has fallen below the business line, may prove to be much lower than sufficient to produce a revenue which will give a reasonable return on the investment a year or a few

years later when the investment will have to be materially increased in order to meet the demands of the business. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 289–290.

Reasonableness of rates in particular cases.

17. The Commission, on its own motion, investigated the complaint of overcharges for electric current furnished the complainant in Mayville, Wis. It appears that there was an error in the meter reading for the month for which overcharge was alleged, but the error was automatically corrected by the reading for the subsequent month. The meters of respondent installed on petitioner's premises were tested and found to be practically correct. *Held:* The average amount of current registered by the meter during the several months under consideration shows that the abnormal amount registered during the month in question was neutralized by the reading for the subsequent month. The respondent has not been guilty of overcharges. *In re Invest. of the Northwestern Lt. & P. Co.* 1911, 7 W. R. C. R. 59, 69–70.

18. The Commission, on its motion, investigated the rates of the Madison G. & El. Co. An analysis was made of the earnings and operating expenses of the company since the previous decision (*State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501) and comparisons were made between the earnings and expenses and the data on which the former order was based. *Held:* Certain reductions should be made for incandescent lighting service. No changes appear advisable at this time for electric arc or electric power service. The respondent is ordered to put into effect the schedule of rates approved by the Commission. *In re Madison G. & El. Co.* 1911, 7 W. R. C. R. 152, 166–169.

19. The city of Beloit, petitioner, alleged that the rates for electric service charged by the respondent, the Beloit W. G. & El. Co., were excessive and yielded an unreasonable return upon a fair valuation of the property; that respondent unlawfully and unreasonably discriminated in its charges for service in favor of certain large consumers; and that its rate schedules were generally discriminatory and inequitably distributed the cost of service between the several classes of consumers. A valuation of the property was made and the revenues and expenditures were investigated. The investment in and operating cost of the plant are not found to be unreasonable. The development of business is relatively and actually poor, and the rates for residence and other small consumers are found to be unjust and inequitable. The residence consumers have been compelled to bear more than their proper share of the cost of the service rendered and current has been sold to large business users at rates so close to, if not actually below, the cost that residence and other small consumers have been forced to return to the plant most of the profits of the business as a whole. This policy has apparently tended to prevent even a reasonable development of the residence business. *Held:* The present rates, as a whole, are somewhat higher than warranted under the circumstances, and they are not as equitably adjusted as they should be. Operating costs should be equitably distributed among the several classes of consumers and rate schedules so constructed as to make each class bear its just share of the total cost of service. Only thus can discrimination between consumers be avoided, the business be developed and the interests of both the public and the company be best served. The reduction which can be made at present must largely be given to those consumers who have been paying under the so-called residence rate. No facts have been found in connection with this or other investigations of utilities of this class which warrant the giving of lower rates to business consumers than to residence consumers under the conditions prevailing in the present case. It will be necessary to postpone any change in rate for business users until sufficiently accurate data can be obtained to justify such further adjustment. It does not appear that the rate

for the arc and incandescent lamps in the municipal contract lighting system should be disturbed at this time. The respondent is ordered to discontinue its present schedule and to place in effect the rates provided by the Commission. It is further ordered that the respondent determine the connected load of all consumers, and that all bills rendered by the company state plainly the connected load of each consumer and the percentage which is considered active in computing the rate. The development of the business which will come under the new schedules ordered, and the adjustments between classes will undoubtedly bring lower unit costs. After a year's operation under the new schedule the Commission will again review the facts and the situation may then reveal conditions which will make possible further adjustments and reductions. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 375–377, 379–381, 384–387.

20. Petitioners allege that the rates charged by the Lodi Municipal El. Lt. Plant are unusual, exorbitant and discriminatory, and particularly that the schedule of rates for meter rental is discriminatory. From such analysis of receipts and expenses as it is possible to make, it is clear that the earnings of the respondent are not excessive or unreasonable. *Held:* A reduction of rates is not warranted at the present time. It is ordered that hereafter meters be installed at the expense of the utility; that the minimum bill be fixed at 50 cts. per month; that where meters are owned by consumers, the utility shall acquire the meters or pay an annual rental of $2 per meter; that the utility take immediate steps to conform with the "Uniform Classification of Accounts" prescribed by the Commission. After meters are in general use, and the accounts of the utility have been kept in the form prescribed by the Commission and as required by the Public Utilities Law, a revision of the rates may be necessary. *Electric Theater et al. v. Lodi Lt. & P. Plant*, 1911, 7 W. R. C. R. 745, 752, 754.

RATES—GAS

See also MINIMUM CHARGES.

Lighting and fuel rates—Two-rate system.

See post 31.

Making rates—Elements considered—Cost of service.

21. It has been demonstrated repeatedly that the total cost of gas service per M cubic feet consumed decreases with increased consumption. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 352.

Making rates—Elements considered—Cost of service—Economies in operation.

22. It is expected, and is quite generally found to be the fact, that in combined plants the rates of general expenses or management costs will be less than in the case of single utilities or plants operating a water, gas, electric, or electric railway property alone. A combination of utilities, such as this case presents, may offer many opportunities for economies not possible in a single utility. Where such economies are made possible, it would appear that while the public is entitled to some share in such benefits as may result from such economies, at the same time the company is entitled to a reward for effecting the results described. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 285.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service.

23. The most important factor in determining the rate of charge is

the cost of service. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256.

24. Rates for the services rendered by public utilities should very largely be based upon the cost to the plants of furnishing the services. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

25. Cost of service is not the only element upon which reasonable rates depend, but in most cases it is the most important element. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

26. Cost of service includes not only the ordinary expenses of operation of the plant, but also includes the items of taxes, depreciation, and interest and profit on investment. Since rates must be controlled largely by the cost and several of the principal elements of cost are immediately affected and determined by the investment, it is at once apparent that the determination of reasonable rates is largely a matter of investigation of the operating expenses and the investment. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

27. Reasonable rates can only be based upon normal and reasonable cost of service, which means that the operating expenses and the investment should be normal and not excessive, in view of the conditions under which the utility must be operated. *City of Beloit v. W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 288.

Reasonableness of rates—Matters considered in determining reasonableness—Relation between investment and growth of business.

28. In determining the reasonableness of rates careful inquiries should be directed to determine the relation between the investment line and the growth of business line at the particular period or year upon which the determination of the cost of service and, therefore, the rates are to be determined. For it is evident from these considerations that if the rates are computed upon the return on an investment which is taken at a point where the investment line is considerably above the business line, that, what appear to be reasonable rates at that point, may prove to be unreasonable and excessive at a point several years further on. Or, on the other hand, what may appear to be reasonable rates when the investment line has fallen below the business line, may prove to be much lower than sufficient to produce a revenue which will give a reasonable return on the investment a year or a few years later when the investment will have to be materially increased in order to meet the demands of the business. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 289–290.

Reasonableness of rates in particular cases.

29. The Commission, on its own motion, investigated the rates of the Madison G. & El. Co. An analysis was made of the earnings and operating expenses of the company since the previous decision (*State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501) and comparisons were made between the earnings and expenses and the data on which the former order was based. *Held:* No changes appear advisable at this time for gas service. Extensive additions now in process of completion are being made and until the company secures fair earnings on the new investment, a further reduction in rates for this service does not appear to be warranted. *In re Madison G. & El. Co.* 1911, 7 W. R. C. R. 152, 166–169.

30. The city of Beloit, petitioner, alleged that the rates for gas charged by the respondent, the Beloit W. G. & El. Co., were excessive and yielded an unreasonable return upon a fair valuation of the property; that respondent unlawfully and unreasonably discriminated in its charges for service in favor of certain large consumers; and that its rate schedules were generally discriminatory and inequitably distrib-

uted the cost of service between the several classes of consumers. A valuation of the property was made and the revenues and expenditures were investigated. It was found that the gas plant is operated and maintained with fair efficiency but the investment appears to be somewhat larger than conditions call for. The situation in regard to the investment in the gas plant makes it far from clear whether it is equitable to the consumer and for the best interests of the plant to fix the rates for gas at a figure which will bring a rate for interest and profits on the cost of reproduction as high as may ordinarily be regarded as adequate in plants of this size. The development of the company's business is comparatively poor. This has been shown to be due largely to the design of the rate schedules. Large users have been encouraged by rates which were so close to, if not below, the actual cost of production, as to make it necessary to burden the smaller consumers with high rates in order to secure a reasonable return upon the investment as a whole. This policy has, in turn, tended to discourage the small users and has prevented a reasonably good saturation of territory and that development of the business which would justify the investment made and reduce the unit cost, and thereby the rates for service. *Held:* Operating costs should be equitably distributed among the several classes of consumers and rate schedules so constructed as to make each class bear its just share of the total cost of service. Only thus can discrimination between consumers be avoided, the business be developed, and the interests of both the public and the company be best served. The present rates, as a whole, are somewhat higher than warranted under the circumstances and they are not as equitably adjusted between the several classes of consumers as rates of this kind should be. The respondent is ordered to discontinue its present schedule of rates and to place in effect the rates provided by the Commission. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 379–381, 383–384.

31. Petitioner alleges that the rates for gas in the city of Neenah, Wis., are unreasonable, unjust and unlawful. The respondent supplies gas to Neenah and Menasha from its Appleton plant, and in addition to its gas plant operates an electric light plant and an interurban and street railway system. The value of the entire gas plant was found and apportioned between Appleton and Neenah and Menasha. The balance sheets, revenues, and expenses were investigated. Comparison was made with other cities of the same class in gas sales, number of consumers, miles of main, sales per capita, sales per consumer, consumers per mile, etc. *Held:* A reduction in rates is warranted in the present case. The respondent is ordered to discontinue its present rates, including the double meter system of selling fuel and illuminating gas under two distinct schedules, and is ordered to put in effect the schedule approved by the Commission. It is recommended that the schedule be also made effective in the cities of Menasha and Appleton. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 490–492.

RATES—RAILWAY

See Rebates or Concessions; Reparation; Schedules or Tariffs; Terminal Charges; various commodity subject headings; Weight.

Commission, power of Commission to regulate rates, *see* Railroad Commission, 7–8.

Departure from published rate prohibited, *see* Schedules or Tariffs, 3–4.

Unreasonable rates, reparation for charging, *see* Reparation, 13–21.

In general—Power of Commission to regulate rates.

32. The statute (sec. 1797—12) empowers the Commission, upon finding, after complaint and investigation, that the rates complained of

are unreasonable, "to fix and order substituted therefor such rate or rates * * * as it shall have determined to be just and reasonable." *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 599.

33. In fixing reasonable rates, the Commission is not bound by the suggestions of the petitioners, but is free to establish what it considers to be reasonable rates under the circumstances of the case. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598–600.

Branch line rates.

34. The cost per unit of traffic is very much greater where the traffic is light than where it is heavy. Rates based upon cost would therefore be higher on branch lines than on the main lines. Ordinarily, however, it is to the best interest of all concerned that such inequalities should be eliminated and that the rates should be based on the conditions for the line as a whole. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 605.

Commodity rates.

35. The effect of special and local conditions at various points enters more or less strongly in the fixing of commodity rates. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600–601.

Commodity rates—Adjustment to conditions.

36. There is no contradiction in fixing rates which are considered to be reasonable as distance rates, and yet leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable. *Ringle et al v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600.

Commodity rates—Specific commodity rates.

37. Specific commodity rates, as a rule, are based on or made to meet special traffic conditions which are not met by general distance class or commodity rates. These rates are lower, in practically all cases, than general distance tariff rates. The exact difference between them cannot, however, be determined in many cases, for the reason that the specific rates are not usually based on distance as are the distance rates. However, if a sufficiently large number of specific commodity rates are taken, including some that apply in each direction from the shipping point, and on branches, a comparison that is of some value may be made between the distance tariff rates and specific commodity rates which happen to cover like distances. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 175.

Joint or through rates.

38. The fixing of joint rates between two or more lines for through hauls from points on one line to points on some other line is always a mooted question. Generally speaking, however, it can be said that the basis for joint rates should be the same as that for local rates. That is, they should, as far as possible, be based on the cost of the service properly modified, when necessary, by competitive and commercial conditions. Joint rates are ordinarily fixed at a lower figure than the sum of the local rates on each line and at a higher figure than the local rate on one line for a like distance. In this state, where the costs per unit on the various lines do not differ greatly, the cost of the joint traffic would seem to exceed the cost of the local traffic for like distances by an amount that about corresponds to the cost of transferring the freight from one line to another and of handling the joint accounts. For carload freight this cost would seem to consist mostly of switching the car from the train on the track of one line to the train on the track of the other. In some cases this may amount to more than an

ordinary switching charge; in other cases, again, it may foot up to less. In this respect much depends on conditions at the transfer point. In no case, however, is it likely to greatly exceed the terminal cost at one point, which in this case would be about one-half of the terminal cost. In fact, we are of the opinion that the addition of one cent per cwt. to the local rates as fixed for given distances in the order in the present case will constitute adequate joint rates between two lines for like distances. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 182–183.

Joint or through rates—Elements of cost.

39. In cases of joint rates the cost of transportation is, of course, increased by additional terminal expenses, due to the fact that the traffic must be transferred from one line to another. Another element that enters into the cost is the empty car mileage. *Mineral Point Zinc Co. v. C. & N. W. R. Co. et al.* 1911, 7 W. R. C. R. 583, 595–596.

Joint or through rates—Establishment of joint rates on blinds—Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to the state line).

See post, 42.

Joint or through rates—Establishment of joint rates on brick and tile—Wisconsin points.

40. Petitioners allege that the single and double line rates for shipments of tile and brick in Wisconsin, for less than 100 miles, are excessive, discriminatory and unjust; that the total of local rates between points on two different roads are in effect prohibitive; that such rates are not made in five mile distances, as on other building material; that they are higher than the rates in adjoining states, and higher than the rates from such states into Wisconsin. Numerous comparisons were made with rates applying between various points on brick, tile, etc., and with distance rates in Wisconsin on various commodities. *Held:* The rates at present in effect are higher than the cost to the carrier warrants. They are also generally higher than those in effect in adjoining states and than the interstate rates into Wisconsin. While the carriers should not so adjust their rates as to offset the difference in the cost of production to the different manufacturers, the weaker producers should be granted as favorable rates as those enjoyed by stronger or better situated producers. Respondents are ordered to put into effect a distance tariff on brick and tile, for distances up to and including 100 miles, as stated herein; the joint rates to be one cent per 100 lbs. higher than the single line rate. The adoption of a distance tariff for distances of from 100 to 300 miles is recommended to the respondent carriers. The order or the recommendation is not to change any rate now in effect lower than the rates provided. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 184–186.

Joint or through rates—Establishment of joint rates on brick and tile—Wisconsin points. (Modification of order.)

41. A petition was filed for rehearing on the order of the Commission (7 W. R. C. R. 170) establishing joint rates on brick and tile for Wisconsin points. Complaint was made that the rates fixed in the former order were unreasonably low; that the order contains conflicting provisions in that the maximum rates are fixed and yet the order, in effect, prohibits the increasing of rates in places where they are lower than

those fixed by the order as reasonable. *Held:* There is no contradiction in fixing rates which are considered reasonable as distance rates, and leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable, the respondents having the right, in case they consider the commodity rates too low, to petition for an increase. Owing to higher value, danger of breakage and inability to load heavily, drain tile and sewer pipe should be eliminated from the order. Sand and lime brick, being about the same in quality and character as other brick, should be included in the order. The request that the lowest rate be fixed at 2 cts. instead of 1.7 cts is reasonable. Respondents are ordered to discontinue their present rates upon shipments of brick, for distances up to and including 300 miles, and to substitute therefor the rates as modified by the Commission. The minimum weight is to remain at 50,000 lbs. *Ringle et al v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600, 604–605, 606–607.

Joint or through rates—Establishment of joint rates on doors—Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to the state line).

See post, 42.

Joint or through rates—Establishment of joint rates on sash, doors and blinds—Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to the state line).

42. Petitioner alleges that the C. L. and L. C. L. rates in effect on respondent's lines on sash and doors from Wausau to "Soo" line stations north of Marshfield to Hurley and west of Abbotsford to the state line are unreasonably high and unjustly discriminatory when compared with similar rates from Oshkosh and Milwaukee to the same points, and that they are higher than rates for hauls of a like distance on one line, plus an adequate charge for transfer and re-billing. The respondents contended against the proposition that rates over two roads should equal the rates for similar distances over one road, plus a reasonable charge for transfer and re-handling. A compilation of rates complained of shows many conflicts and inconsistencies in the tariffs. It is shown that the L. C. L. through rate and the C. L. rate between Wausau and the points named on the "Soo" line is the same as the local rates between Milwaukee and the same points, with some exceptions, and higher than the Oshkosh rate and that specific joint rates voluntarily put in effect by railroad companies follow closely the specific single line rates for similar distances in the same territory. The present method of respondents of making Milwaukee the basis of the Wausau rates, a point more than three times the distance of Wausau from the points to which rates are made, practically results in making no joint rates from Wausau. *Held:* There seems to be no reason why specific joint rates between Wausau and the "Soo" line points comprehended in the petition should not be established, nor why the basis for such joint rates should vary greatly from the basis used in making similar joint rates between other points in the state. It is ordered that the respondents put in effect on sash, doors and blinds the schedule of rates approved by the Commission. The class rates named are slightly higher, but are based largely upon the single line distance rates in effect for like distances and correspond with joint rates voluntarily put in effect by railways. The C. L. rates are one cent higher than C. L. rates on lumber, as fixed by the Commission. A

complete schedule of class rates is recommended to the respondents. *Curtis & Yale Co. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 41, 54, 56–58.

Joint or through rates—Establishment of joint rates on tile—Wisconsin points.

See ante, 40.

Joint or through rates—Establishment of joint rates on zinc ore—Wisconsin points on the C. & N. W., the C. M. & St. P., and the M. Pt. & N. lines to Mineral Point, Wis.

43. The petitioner prays for the establishment of joint commodity rates on zinc ore shipments from certain Wisconsin mining points over the lines of the C. & N. W., the C. M. & St. P., and M. Pt. & N. railway companies to Mineral Point, Wis. Respondents formerly had joint rates in effect but they were canceled, and it was proposed to further change and increase the rates on the C. & N. W. and the M. Pt. & N. lines. The effectiveness of this change was stayed by the Commission pending a decision on this petition. The C. & N. W. R. Co. suggested that the extremely low rate given to the petitioner by the C. M. & St. P. line on shipments out to the petitioner's Illinois plant, coupled with the fact that the petitioner was the virtual owner of the M. Pt. & N. Ry., made the latter railway, as a matter of fact, a "tapped line proposition," and that it would be not only commercially unwise but actually illegal for the C. & N. W. line, by the establishment of a joint rate, to become a party to such a scheme. The petitioner denied this charge and contended that the Wisconsin distance tariff class E rates were too high for the shipments of ore involved under the present system of applying the rate for the combined distance, as well as under the proposed system of applying the two local rates for the distances to and from the junction point. From comparisons made, it is shown that the rates complained of are materially higher than those in effect in zinc ore producing sections in other states. *Held:* The comparatively low value of this ore, the regularity of the movement, the freedom from damage in transit, the adaptability to almost any kind of railway equipment, the heavy loading per car and the small proportion of dead weight to pay weight, the relatively low cost per unit of traffic and the competitive and commercial conditions entitle it to a comparatively low rate. A terminal charge of 60 cts. per ton and a movement charge of 6 mills per ton-mile will cover the proportion this traffic should bear of the operating expenses and returns on the investment. Joint rates in the present case should not exceed 4.50 cts. per cwt. and they are ordered on that basis. *Mineral Point Zinc Co. v. C. & N. W. R. Co. et al.* 1911, 7 W. R. C. R. 583, 593-594, 596-597.

Joint or through rates—On raw materials manufactured on originating line.

44. The carriers in the present case object to establishing joint rates on raw material originating on their own lines and which can also be manufactured into finished products at points on their own lines, in cases where such joint rates may tend to reduce their traffic. With this position it is difficult to quarrel, at least when it is not carried to a point where the public interests involved are greater than those of the carrier. However, under the conditions in the present case public interests demand that the rates should be so adjusted as to result in the greatest good to the greatest number. For handling such traffic, carriers are entitled to rates that will yield them returns that are fully adequate as compensation for their services. But when assured of

such rates, it is their duty, under the circumstances, to grant joint rates and traffic arrangements. *Mineral Point Zinc Co. v. C. & N. W. R. Co. et al.* 1911, 7 W. R. C. R. 583, 596–597.

Making rates—Adjustment of rates to conditions.

45. There is no contradiction in fixing rates which are considered to be reasonable as distance rates, and yet leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600.

Making rates—Elements considered.

46. The most important element in the fixing of rates is the cost of service, subject to modification by reason of commercial conditions, such as the value of the article carried, the competitive situation of both the producer and the carrier, etc. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600.

Making rates—Elements considered—Commercial conditions.

See ante, 46.

Making rates—Elements considered—Comparative data.

47. Comparisons with rates elsewhere in effect are of value, not as determining what the rates in a given case should be, but as an indication of the conditions which surround the industry as a whole. It need hardly be pointed out that the financial and commercial situation of almost every industry is largely affected by the cost of transporting its products. Thus, while the cost of service is the element of most vital importance, a comparison of existing rates with the rates under which similar traffic actually moves in other regions is also of some value. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600

Making rates—Elements considered—Competitive conditions.

See ante, 46.

Making rates—Elements considered—Cost of service.

48. In cases of joint rates the cost of transportation is, of course, increased by additional terminal expenses, due to the fact that the traffic must be transferred from one line to another. Another element that enters into the cost is the empty car mileage. *Mineral Point Zinc Co. v. C. & N. W. R. Co. et al.* 1911, 7 W. R. C. R. 583, 595–596.

49. The cost of service is the element of most vital importance in making railway rates. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600.

50. The cost per unit of traffic is very much greater where the traffic is light than where it is heavy. Rates based upon cost would therefore be higher on branch lines than on the main lines. Ordinarily, however, it is to the best interest of all concerned that such inequalities should be eliminated and that the rates should be based on the conditions for the line as a whole. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 605.

Making rates—Elements considered—Cost of service—Terminal and movement expenses.

51. The proper unit for the terminal expenses is the ton through the loaded car. The proper unit for the movement expenses is the ton per mile. When the operating expenses for 1910 of one of the leading lines in the state are treated in this manner, and when they include interest

at about 6 per cent on the present value of the road as computed from the appraisal, it is found that for a carload of 30 tons the average cost per unit amounts to nearly 1.40 cts. per cwt. for terminal and to about 0.2 mill per cwt. per mile for movement expenses. These items, therefore, when the movement cost is so adjusted as to cover the increased cost of moving way freight, may be safely used as one of the leading bases upon which to decide the present case. *Ringle et al v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 182.

Making rates—Elements considered—Local conditions.

52. The effect of special and local conditions at various points enters more or less strongly in the fixing of commodity rates. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600–601.

Making rates—Elements considered—Value of article carried.

See ante, 46.

Making rates—Gradation of rates—Way freight and through hauls.

53. The way freight haul is relatively more costly than through hauls, and it is one of the essentials of a rate schedule to provide for this difference. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 605.

54. The increase in movement cost for the short or way freight haul in a continuous schedule has to be equalized by a correspondingly low movement cost for an equal distance beyond the way freight haul in order to bring the figures down to normal. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 605–606.

Manufacturer's rates.

55. The practice of railroads in this state of making lower freight rates to manufacturers than to the general public, has been established a great many years. This practice is still continued to a greater or less degree, but the general tendency seems to be to reduce the number of these rates. As a general rule, such rates at present are restricted to commodities that go to manufacturers to be manufactured into other commodities, and to commodities that go to a concentrating point in less than carload lots, to be stored, worked over, and prepared for reshipment in carload lots. Such rates are almost invariably subject to the condition that the product shipped out from the manufacturing and concentrating points must be shipped over the railroad that hauled the original commodity to the manufacturing and concentrating points. *South Milwaukee Fuel & Supply Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 1, 6.

56. The equity of lower freight rates for manufacturers than for the general public has been previously discussed by the Commission. Sec. 1797—6 of the Railroad Law is understood to authorize such rates, and the principle has been recognized by the Commission in a number of cases. *(In re Rates on Construction Material,* 1906, 1 W. R. C. R. 210.) (*Valvoline Oil Co. v. C. & N. W. R. Co. et al.* 1908, 2 W. R. C. R. 232.) (*Cochrane Co. v. C. M. & St. P. R. Co.* 1908, 3 W. R. C. R. 1.) *South Milwaukee Fuel & Supply Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 1, 6.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service.

57. The absolute reasonableness of all of the rates in question depends very largely upon the cost to the carriers of the traffic involved. That this is the case can hardly be disputed, for the cost of

production is the factor which plays the greatest part in nearly all prices. This cost of the traffic is also made the legal basis for rates, for the law provides in substance that under normal conditions the carriers are entitled to such compensation for their services that their receipts from this source as a whole will cover the necessary operating expenses, including reasonable returns upon their investment. This does not mean that if the carriers are entitled to, say, 7 per cent for interest and profit above other operating expenses, the rates on each class of traffic or kind of commodity should be so fixed as to yield this amount. It simply means that this is the return that should be obtained from the traffic as whole; that each class or kind of traffic should contribute to this return in proportion to the cost of transportation, modified by the value of the articles carried and other factors. When all the factors which enter into rate making are thus properly taken into account in making rates, it will be found that the rates on high priced articles yield much more than the average return and that the rates on low priced articles yield considerably less than the average return. Under ordinary conditions, however, no rate is or should be made so low that when all the elements are taken into account it is not found to yield enough to cover operating expenses, including something in the way of a return upon the investment. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 179–180.

58. The cost of transportation depends on many factors and is greatly affected by the loading per car and the risks involved. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 181.

Reasonableness of rates—Matters considered in determining reasonableness—Relation to other rates.

See post, 73.

Reasonableness of rates—Matters considered in determining reasonableness—Value of articles carried.

59. An element of much importance in judging of the reasonableness of a given system of rates is the value of the commodity carried. It is axiomatic that a commodity of low value in proportion to its weight should not pay as high a freight rate, other things being equal, as a commodity of high value. *Mineral Point Zinc Co. v. C. & N. W. R. Co. et al.* 1911, 7 W. R. C. R. 583, 594.

Reasonableness of rates in particular cases—Wisconsin points on Marathon County Railway.

60. Applicant prays for authority to increase rates on the grounds that the rates in effect, which were fixed by the Commission in 1907 (*Streveler v. Marathon Co. R. Co.* 1907, 1 W. R. C. R. 831, as modified in 2 W. R. C. R. 64), are not sufficient to afford a reasonable return on the investment. It is shown that there had been a large decrease in the amount of traffic; that the expenses per ton-mile are much less than that of most other roads of a similar size in the state; that the rates are less than on corresponding lines and that the petitioner is operating at a considerable loss. *Held:* Present conditions differ so materially from the conditions in 1907 as to make an increase of the rates over those fixed by the Commission at that time not only justifiable but necessary. The rates suggested preserve very nearly the relation of two-thirds to one as between jimmy and standard cars, and this relationship is believed, under the evidence now before the Commission, to be fair to all concerned. The petitioner is authorized to increase its rates as ordered. *In re Marathon County R. Co.* 1911, 7 W. R. C. R. 392, 399–400.

Reasonableness of rates in particular cases—Agricultural implements and vehicles, Milwaukee to Wisconsin points.

61. Petitioner alleges overcharges on various shipments of vehicles and agricultural implements from Milwaukee to different points in Wisconsin. The rate contended for was put in effect after the shipment moved. *Held:* The rate charged was unusual and exorbitant, and a reasonable charge for the services rendered would have been a rate of 18 cts. per cwt. as subsequently made effective. *Lindsay Bros. v. M. St. P. & S. S. M. R. Co.* 1911, 7 W. R. C. R. 17, 18.

Reasonableness of rates in particular cases—Brick and tile, Wisconsin points.

62. Petitioners allege that the single and double line rates for shipments of tile and brick in Wisconsin, for less than 100 miles, are excessive, discriminatory and unjust; that the total of local rates between points on two different roads are in effect prohibitive; that such rates are not made in five mile distances, as on other building material; that they are higher than the rates in adjoining states, and higher than the rates from such states into Wisconsin. Numerous comparisons were made with rates applying between various points on brick, tile, etc., and with distance rates in Wisconsin on various commodities. *Held:* The rates at present in effect are higher than the cost to the carrier warrants. They are also generally higher than those in effect in adjoining states and than the interstate rates into Wisconsin. While the carriers should not so adjust their rates as to offset the difference in the cost of production to the different manufacturers, the weaker producers should be granted as favorable rates as those enjoyed by stronger or better situated producers. Respondents are ordered to put into effect a distance tariff on brick and tile, for distances up to and including 100 miles, as stated herein; the joint rates to be one cent per 100 lbs. higher than the single line rate. The adoption of a distance tariff for distances of from 100 to 300 miles is recommended to the respondent carriers. The order or the recommendation is not to change any rate now in effect lower than the rates provided. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 184–186.

63. A petition was filed for a rehearing on the order of the Commission (7 W. R. C. R. 170) establishing joint rates on brick and tile for Wisconsin points. Complaint was made that the rates fixed in the former order were unreasonably low; that the order contains conflicting provisions in that the maximum rates are fixed and yet the order, in effect, prohibits the increasing of rates in places where they are lower than those fixed by the order as reasonable. *Held:* There is no contradiction in fixing rates which are considered reasonable as distance rates, and leaving lower commodity rates in effect for points at which special conditions may make such rates reasonable, the respondents having the right, in case they consider the commodity rates too low, to petition for an increase. Owing to higher value, danger of breakage and inability to load heavily, drain tile and sewer pipe should be eliminated from the order. Sand and lime brick, being about the same in quality and character as other brick, should be included in the order. The request that the lowest rate be fixed at 2 cts. instead of 1.7 cts. is reasonable. Respondents are ordered to discontinue their present rates upon shipments of brick, for distances up to and including 300 miles, and to substitute therefor the rates as modified by the Commission. The minimum weight is to remain at 50,000 lbs. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 598, 600, 604–605, 606–607.

Reasonableness of rates in particular cases—Coal, coke, etc., Cudahy and South Milwaukee from Milwaukee, Wis.

64. Petitioner, in behalf of itself and other coal merchants in Cudahy and South Milwaukee, alleges that these stations, located seven and ten miles, respectively, from Milwaukee, are terminal points on respondent company's line, and that the rates on coal, coke and similar shipments from Milwaukee to Cudahy and South Milwaukee are higher than such rates to other terminal points in and about the city of Milwaukee; that such rates are unreasonable and discriminatory; that manufacturers at the various terminal points in and about Milwaukee enjoy lower rates on different commodities in carload lots than are available to persons not manufacturers; that the rate on coke from Chicago to South Milwaukee and Cudahy is 45 cts. per ton, and that the same rate is exacted from Milwaukee to those points, for one-tenth of the distance; and that the rates on coal between Milwaukee and South Milwaukee and Cudahy are now 35 and 40 cts. per ton, as against a former rate of 25 cts. Respondent company had prepared a new tariff, which had been published but was not yet effective at the time of the hearing, which remedied these discriminatory conditions by placing all manufacturing districts in and about Milwaukee upon practically the same rate basis, and which does not discriminate between manufacturers and other consignees. *Held:* Cudahy and South Milwaukee should be placed upon the same rate basis as other manufacturing districts in and about Milwaukee. *South Milwaukee Fuel & Supply Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 1, 9–11.

Reasonableness of rates in particular cases—Forest products—Rib Lake from Spirit Falls and to Chelsea.

65. On a rehearing relating to an order issued by the Commission requiring the operation as a common carrier, of a line of railway between Rib Lake and Spirit Falls, Wis. (*Meyer v. Rib Lake Lbr. Co. et al.* 1909, 4 W. R. C. R. 178), the point was raised that the rates charged for transporting forest products from near Spirit Falls to Rib Lake and from Rib Lake to Chelsea are unreasonable and excessive. The Commission investigated the cost of reconstructing the line, the valuation, and the expense of operation. In determining upon the rates for the line in question, it must be borne in mind that the commodities to be moved out are in many cases relatively low grade commodities; that the territory through which the line runs is little developed and it is to the interest of the railway company as well as of the shippers that it be developed as rapidly as possible; and that the line is to be, to all intents and purposes, a branch of the M. St. P. & S. S. M. R. and as such need not, as a matter of good railway economics, be highly profitable in itself. *Held:* Rates fixed so as to pay operating expenses and taxes upon the line, and a little additional as interest upon the investment, will yield all the railway company can fairly ask at the present time. It is ordered that the respondent, Wis. C. R. Co. and its successor, the M. St. P. & S. S. M. R. Co., cease charging any higher rates for transportation either way between Spirit Falls and Rib Lake and intervening points than those prescribed by the Commission. *Meyer v. Rib Lake Lbr. Co. et al.* 1911, 7 W. R. C. R. 401, 407, 420, 425.

Reasonableness of rates in particular cases—Grain, Wisconsin points on the M. St. P. & S. S. M. R. Co. to Superior, Wis.

66. Complaint was made of unusual and exorbitant switching charges on 490 cars of grain switched from the connection of the respondent's line with that of the M. St. P. & S. S. M. R. Co. to the petitioner's mills in the city of Superior, Wis. A charge of $3.00 per car was exacted. In *Duluth-Superior Milling Company et al. v. N. P. R. Co.* 1910, 5 W. R.

C. R. 598, it was held that a similar charge was unusual, as it was double the amount charged by other railway companies for a similar service within the city of Superior. It was also found that $1.50 per car would be reasonably compensatory for such switching service, and the charge was accordingly reduced to that amount. The conclusion there reached is controlling in the instant case. *Held:* The rate exacted was unusual and exorbitant, and a reasonable charge would have been the rate previously established by the Commission. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461–462.

Reasonableness of rates in particular cases—Lime, Oakfield to Hackley and Mountain, Wis.

67. Petitioner alleges overcharges on certain shipments of lime from Oakfield to Hackley and Mountain, Wis. Following the shipments, a change in classification was made, which had the effect of reducing a part of the rates in question. *Held:* The rates exacted for a part of the shipments were unusual and exorbitant, and reasonable rates would have been those subsequently established through the change in classification. *Standard Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 149, 151.

Reasonableness of rates in particular cases—Live stock, Wisconsin points on C. & N. W. R.

68. Petitioners complained that the tariff formerly in effect on respondent's lines allowing one stop in transit to finish loading of live stock, had been changed so that it is now necessary to ship from originating point to stopping point, and from stopping point to destination at the sum of the two locals. This change amounts to a material increase in rates. It was contended by the respondent that the principal reason for the change was to avoid delay in stock shipments. It was shown that the change did not materially affect the time of shipments, and that its principal effect was to increase rates. *Held:* The withdrawal of the stoppage in transit privilege resulted in an unwarranted increase in rates throughout the state on stock shipments stopped to finish loading. Respondent received sufficient compensation in its regular rates on live stock, and in the additional charge for stoppage privilege to warrant an order requiring reinstatement of such privilege in the form in which it was formerly in effect. Since the scope of this proceeding does not cover all of the respondent's lines, the restoration of the transit privilege is ordered only for the stations named in the complaint. It is recommended that such privilege be reinstated generally on the lines of the respondent throughout the state. *Arries & Packham et al. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 131, 139.

Reasonableness of rates in particular cases—Logs, Marston Spur to Drummond, Wis.

69. Petitioner alleges overcharges on various shipments of logs from Marston Spur to Drummond, Wis. The rate contended for had been in effect before July 1, 1910, and was again made effective on Jan. 14, 1911, after the shipments had moved. *Held:* The charge exacted was unusual and exorbitant and a reasonable charge would have been based on the rate as previously in effect and subsequently reëstablished. *Rust Owen Lbr. Co. v. C. St. P. M. & O. R. Co.* 1911, 7 W. R. C. R. 12, 13.

Reasonableness of rates in particular cases—Lumber, Ashland to Hayward, Wis.

70. Petitioner alleges overcharges on shipments of seven cars of lumber from Ashland to Hayward, Wis. The rate contended for was

put in effect after the shipment moved. *Held:* The rate exacted was unreasonable, and a reasonable rate to have charged for the shipment would have been 2 cts. per cwt., in accordance with tariff now in effect. *Edward Hines Lbr. Co. v. C. St. P. M. & O. R. Co.* 1911, 7 W. R. C. R. 14, 16.

Reasonableness of rates in particular cases—Lumber, Goodman to Tomahawk, Wis.

71. Petitioner alleged overcharges on a carload shipment of lumber from Goodman to Tomahawk, Wis. A manufacturer's rate of 6 cts. per cwt. had been agreed upon prior to the shipment, and was subsequently put into legal effect. *Held:* The local rate exacted was unusual and exorbitant and the reasonable rate would have been the rate subsequently made effective. *Brown Land & Lbr. Co. v. M. St. P. & S. S. M. R. Co.* 1911, 7 W. R. C. R. 581, 582.

Reasonableness of rates in particular cases—Lumber, Laona to Wisconsin points.

72. Complaint was made of excessive rates on shipments of lumber from Laona, Wis. to various points within the state. Subsequent to the shipments the rates in question were greatly reduced. *Held:* The rates exacted were unusual and the reasonable charges for the service rendered would have been the rates now in effect. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 782–783.

Reasonableness of rates in particular cases—Tile, Wisconsin points.

See ante, 62.

Reasonableness of rates in particular cases—Vehicles, Milwaukee to Wisconsin points.

See ante, 61.

Relation of rates—Adjustment for differences in cost of production.

73. While the practice of adjusting rates so as to offset differences in the cost of production would ordinarily be out of line with public policy as well as contrary to sound economic principles, the weaker producers should be granted rates that are relatively as favorable as the rates under which the stronger or better situated producers are shipping. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 183.

Through rates.

See ante, Joint or through rates.

Transit rates—Restoration of.

See ante, 68.

RATES—TELEPHONE

Reasonableness of advance in rates in particular cases.

74. Application was made by the Morris Tel. Co. for authority to increase its rates. The applicant desires to put into effect a charge of 50 cts. per month for all subscribers, requiring them, as in the past, to furnish their own instruments. *Held:* The probable earnings under the proposed rate are so low that the propriety of granting the rate cannot be questioned. The applicant is authorized to add a monthly

charge of 50 cts. per subscriber to its present schedule of rates. *In re Appl. Morris Tel. Co.* 1911, 7 W. R. C. R. 426, 427.

75. Application was made by the Ozaukee–Washington Tel. Co. for authority to increase its rates. The applicant prays for authority to adjust and equalize the rates of three telephone companies which it has consolidated. A valuation of the property was made and the revenues and expenses were investigated. *Held:* Under the proposed rates the legitimate expenses, including taxes, depreciation and interest on the estimated valuation will at least equal the estimated income. Application granted. *In re Appl. Ozaukee–Washington Tel. Co.* 1911, 7 W. R. C. R. 428, 434.

76. Application was made by the Pewaukee–Sussex Tel. Co. for authority to increase rates for business telephones. The rates in effect at the present time are the same for business as for resident telephones. An analysis of the operating expenses of the applicant indicates that they are not excessive. The revenues under existing rates are sufficient to pay expenses, depreciation and a reasonable return on the valuation as reported. *Held:* Business telephones should pay higher rates than residence telephones, but the increase of rates proposed by the applicant is excessive. The applicant is authorized to increase its rates for business telephones $3 per year and to put in effect a business rate for the summer season only. *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 473, 475–476.

77. Complaint was made of certain irregularities and discriminations on the part of the Platteville, Rewey & Ellenboro Tel. Co. Shortly before the hearing upon the complaint application was made by the company for authority to increase its rates. Under the application for authority to increase rates all the matters included in the petition are proper subjects of consideration and the effect on the jurisdiction of the Commission of the fact that four of the petitioners withdrew their names, leaving the number of signers less than twenty-five, is not decided. The valuation of the property and the receipts and expenses were investigated. *Held:* Until the establishment of the metallic circuit the rates are to be left as they are at present, and all discrimination between stockholders and non-stockholders and all free or reduced rate service are to be discontinued. Upon the completion of the improvements ordered, the company is to put in effect the schedule of rates prescribed by the Commission. *In re Platteville, Rewey & Ellenboro Tel. Co.* 1911, 7 W. R. C. R. 608, 619–620.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service.

78. If the applicant wishes to pay its manager less and its directors more than the usual amount for their supervision of the plant, it would seem that the matter is one which should be left to the business judgment of the applicant, so long as the total supervision cost is not excessive. *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 470.

79. In the case of telephone companies, as in other utilities, the expense may be divided into two groups, those varying with the amount of business done, or the variable expenses, and those which remain practically the same whatever the amount of business done, or the fixed expenses. *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

80. Cost of service is the best test of the reasonableness of rates, provided it is commercially feasible and otherwise equitable. (*Payne v. Wis. Tel. Co.* 1909, 4 W. R. C. R. 1, 58.) *In re Appl. Pewaukee–Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

Special service rates—Business and residence rates—Physician's telephone in residence.

81. A ruling was requested as to the status of physicians' telephones when placed in a residence or an office which is a part of a residence. There is no doubt that where a physician has a detached office, his telephone located therein is a business telephone. Where the place of business and the residence of a subscriber are in the same premises and no telephone is installed in the place of business, the business rate should be charged for the telephone installed in the residence. It follows logically from these principles that where a physician or other subscriber uses a residence telephone primarily for business purposes, he should pay a business rate. The controlling fact in determining whether the telephone is a residence or business telephone, for rate purposes, is the character of the use which is customarily made of it. (*In re Free and Reduced Rate Telephone Service*, 1908, 2 W. R. C. R. 521, 544.) *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 475.

Special service rates—Different rates for different classes of service.

82. The principle that business telephones should ordinarily pay a higher rate than residence telephones is adopted by nearly every telephone company and seems to be in accordance with sound theory. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 470–471.

83. There is a sound basis in the cost of operation for some difference of rates between business and residence telephones. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

84. Moreover, it is generally true, at least in the smaller cities and villages, that in order to make it worth while for business houses to use the telephone, the community must be well supplied with residence phones, and this in itself often necessitates a lower rate for residence than for business telephones. *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 471.

85. The classification of telephone subscribers into residence and business subscribers, with higher rates for the latter than for the former, is lawful and permissible, not only from the point of view of the greater cost of providing the business service, but also because of the coördinate principle that a lower residence rate is necessary in order that a sufficiently large number of subscribers may be secured to make the telephone valuable to business subscribers. (*In re Free and Reduced Rate Telephone Service*, 1908, 2 W. R. C. R. 521, 542.) *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

86. The proposition seems to be so well established as to be almost axiomatic, that the business telephone must bear more than its proportionate share of the expense in order that there may be residence telephones; theoretically, at least, the residence telephones add value to the service of the business telephones, so that, from the standpoint of the value of the service, business subscribers may have no cause to complain. (*Payne v. Wis. Tel. Co.* 1909, 4 W. R. C. R. 1, 56.) *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

87. Another ground upon which a different schedule of rates for business and residence telephone service may be justified is the greater expense of handling the traffic of business telephones. The business telephone makes a greater demand upon the operating force than the residence telephone in a majority of cases, perhaps, though in communities which are socially active the difference in amount of use may not be so marked. To whatever extent this difference does exist, it undoubtedly justifies a difference in rates. A disparity between rates which is based upon the cost of producing service is logical, and, in fact,

no disparity at all. Cost of service is the best test of the reasonableness of rates, provided it is commercially feasible and otherwise equitable. (*Payne v. Wis. Tel. Co.* 1909, 4 W. R. C. R. 1, 57–58.) *In re Appl. Pewaukee-Sussex Tel. Co.* 1911, 7 W. R. C. R. 465, 472.

Special service rates—Extension rates.

88. In the present case it was suggested that the extension rate should be about half the regular telephone rate. This amount, or a little less, would seem to be about the usual proportion. *In re Platteville, Rewey & Ellenboro Tel. Co.* 1911, 7 W. R. C. R. 608, 618.

RATES—TOLL BRIDGE

Reasonableness of rates in particular cases—Sturgeon Bay, Wis.

89. Petitioner alleges that the respondent charges unreasonable tolls for automobiles over its toll bridge at Sturgeon Bay, Wis. *Held:* Respondent's present tolls for automobiles are unreasonable. The respondent is ordered to discontinue its present toll for automobiles and to substitute therefor a toll of 15 cts. each one way and 25 cts. for each round trip. *City of Sturgeon Bay v. Sturgeon Bay Bridge Co.* 1911, 7 W. R. C. R. 727, 736.

RATES—WATER

Discrimination in water rates, *see* DISCRIMINATION.

Fire protection rates.

90. The determination of the proper charge to the public for fire service rests largely upon the matter of investment. The amount of water used has practically no effect on the final result, as the quantity consumed for fire service is practically negligible. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 336.

91. Unless there are reasons peculiar to the local situation why a departure from this policy appears reasonable and equitable, the city ought to pay the full cost of fire protection, but it does not seem to be fair to charge more for fire service than the cost of that service, including in the cost interest and depreciation on the proper share of the property. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 557.

92. It is obvious that, other conditions remaining the same, the cost of fire protection bears but a very slight relation to the number of hydrants. The fire demand, which, in turn, determines very largely what investment is required for purposes of furnishing fire protection, is not made by the hydrants themselves, but by the district to be protected, and consequently the interest, depreciation, taxes, and capacity expenses are dependent upon the fire demand and not upon the number of fixtures through which the demand may be exercised. This does not mean that extensions of the fire protection system into new districts do not have an influence upon the cost of fire protection. If the distribution system is extended into a district to which fire protection had not previously been furnished, the total fire demand of the entire community to which protection is furnished is increased, because protection is supplied to an enlarged area. It should be borne in mind, however, that even in such cases the demand, and consequently the expenses, are not occasioned by the number of hydrants, but by the fire risk of the new district to be protected. Where it is the practice to install hydrants at stated intervals, it is, of course, possible to make a rate per hydrant which answers the purpose. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 565.

93. In general it may be said that where fire protection is already furnished to a certain district; the installation of additional hydrants within that district will not affect the cost of fire protection, except by

the amount of interest, depreciation and taxes on additional hydrants installed. Where new districts are protected the cost of protection is increased, but because there is a greater risk and a consequently greater fire demand and not because there are additional hydrants placed upon such extensions. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 565.

Fire protection rates—Adjustment on extension of mains.

94. The additional charge for fire protection service which arises when extensions are laid and new hydrants installed thereon will depend on such factors as the cost of the extension, the number of hydrants installed, the probable consumption of water by the new consumers reached, etc. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 336.

95. As the proposed extension in the present case is not such that, if a number were made, the capacity of the plant would have to be increased in order to meet the demand, it would seem that the rate for fire protection on this extension would not include any of the capacity expenses of the utility, as these have already been included in the rate for existing fire protection. The cost to the city, therefore, for fire protection on this proposed extension, should be made up of the amount of interest and depreciation on the extension itself, and the cost to the utility of pumping whatever additional water is required. Practically the only additional pumpage, aside from what water may actually be used in time of fire, will be the amount of leakage. Of course, there is also an added cost of keeping water in the main, even if none is used, but this appears to be very slight and is almost impossible of determination. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 696.

96. The total fire risk of the city is increased by the inclusion of additional buildings within the fire protection limits. In making the apportionment of expenses in the present case, the total fire demand was the maximum demand which the station must be prepared to meet in order to furnish adequate protection to the property within the present protection limits. When a new district is included within these limits, the total fire risk and the total demand which the plant must be prepared to meet are increased. Of course, it is true that a single addition to the protected area may not necessitate increased capacity at the station. Nevertheless, it is undeniable that additions cannot be made indefinitely without making it necessary to increase the station capacity. In this case it would be obviously unfair to charge the entire cost of increased capacity, or the entire increase in capacity expenses, entirely to the addition which finally necessitated the increased capacity. A general readjustment should probably be made at such time as this condition arises. As a matter of theory, the first addition should bear its share just as much as the second, or the third, or the one which finaliy compels the increase of the capacity of the plant, but there are practical objections to this plan, as pointed out later. In a case where the extension has not been made, one way of estimating the cost to the utility is to consider that this extension will occasion the same expense as a main already in use, of the same general characteristics. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 700.

97. As conditions are at present, it would seem fair to charge the entire amount of interest and depreciation on the extension in question to the fire service. Certainly, this is a cost to the utility which should be met by consumers, and as the city is the only consumer, it seems that this expense should be met by the city. As stated above, however, the interest and depreciation on the main and hydrants do not constitute the only cost of furnishing water under pressure for fire protection to new and previously unprotected districts. There is a portion of the capacity expenses of the plant which are also properly

chargeable, theoretically, to this service. The difficulty, of course, is to determine what these expenses will be. Probably the most satisfactory method of arriving at this amount will be to pro-rate the pumping station capacity expenses which are chargeable to fire protection among the existing hydrants and assume that the new extension should be charged at about the same rate. The use of the number of hydrants as the basis can be justified because of the fact that they have been installed at uniform distances, at least to a large extent. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 701.

98. It is not believed that this pro-rating of station capacity expenses according to the number of hydrants, or really according to the length of mains, gives a result which is absolutely correct, because the demand upon the station depends upon the nature of the district to be protected rather than on the length of mains or number of hydrants. It does furnish a guide, however, to the proper amount to be charged to the new extension. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 702.

99. While in theory each increase in the protected area has its effect upon the demand and so upon the capacity, it may be a long time before an actual, appreciable increase in demand is made and before the station capacity must be increased. It seems to be generally true that increases in capacity do not follow closely the extension of the protection limits. Rather, there are times when the plant capacity is greater than the actual need, and the capacity will not be increased until it has fallen somewhat below the theoretical maximum demand. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 703.

100. While, in theory, each extension increases the demand upon the station and so affects the required capacity, in practice no attention is given to this until the extensions have been sufficiently numerous to make necessary an actual increase in plant capacity. From this it seems to follow that, while, as a theoretical proposition, each extension should be charged with interest and depreciation on a portion of the station investment, in actual practice the full amounts of such interest and depreciation which are due to the fire service are borne by the existing system. If, then, the rate for the extension, even when it reaches a new district, is made without including any allowance for interest and depreciation on the station, the total charge to the city for fire protection will include the total present cost of these items, and the final result will be just. If it were necessary to apportion the cost of fire service among several consumers, as would be the case if the proposed main were to supply some demand other than that exerted by the city in the present case, it would be necessary to apportion a proper share of such interest and depreciation to it. In this case, however, the city is the only party demanding fire service of the kind in question, and the important consideration is to have the total charge correct. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 703–704.

101. If the proposed main in the present case is put in, it might seem that some of the interest and depreciation on the station investment should be charged to it. If the main is not put in, however, these expenses still remain and must be met by the existing system. In order to determine, as a matter of practice, whether or not the main in question should be put in, therefore, it seems best to take into consideration only the actual increased cost to the plant at the present time. If, in the future, enough extensions are made to necessitate an actual increase in plant capacity, a readjustment of the charge for fire protection may be made at that time. This would indicate that in the present case no allowance should be made, in practice, for the theoretical increase of demand and of capacity. The same seems to hold true with regard to the general expenses. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 704.

Fire protection rates—Inside fire protection—Automatic sprinkler systems.

102. With regard to inside fire protection, such as automatic sprinkler systems, the charge directly to the property protected may be justified. It is not ordinarily regarded as being the duty of a city to furnish inside fire protection, but, aside from any theories as to the city's obligations, the charge for such protection appears to be in accord with the cost of service principle. The demand which may be made by an automatic sprinkler system is entirely apart from either the domestic demand or that of the hydrant system. From the very nature of the service it is likely to occur at the same time as the ordinary fire demand. When an automatic sprinkler system is in use, the water works must have a capacity equal to the combined domestic and hydrant demands, with sufficient leeway to take care of sprinkler systems. This is especially true in case of fire destroying a building equipped with sprinklers, where the pipe supplying sprinklers is likely to be broken, yet the water works must be capable of supplying its other service, even with the waste through broken connections. It is true that the installation of a single sprinkler system might not affect the required capacity of the plant and the investment, but any general introduction of such systems would certainly require an increased station capacity. Investment and operating expenses are directly affected by such sprinkler systems, which indicates that inside fire protection is a class of service which should be charged for independently of other classes, and charged directly to the parties served. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 568-569.

Fire protection rates—Protection through privately owned hydrants.

103. In view of the fact that it is a recognized function of a city to furnish reasonably adequate fire protection, it seems clear that, as far as the water utility is concerned, the city should be the only party to pay for hydrant fire protection. The mere fact that a city fails to fulfill its duty of supplying adequate fire protection to buildings and structures within its limits, does not justify the water utility in making a charge against a private concern because that concern has installed hydrants which enable it to secure adequate protection. The fire demand of the city must be taken as a unit, and this can only be done when the city itself is the only party to whom the utility sells water under pressure for fire protection. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 567.

104. In the light of the facts it seems incontrovertible that a charge should be made against the city and against the city only, sufficient to meet the cost occasioned by the fire demand of the city as a whole, and that there should be no charge for private hydrant fire protection. To be sure, a private concern may put in a larger number of hydrants than the city would have installed. It should be remembered, however, that the city should give adequate protection. If a private concern puts in more hydrants than are necessary to furnish such protection, the concern can make no greater demand upon the utility by virtue of that fact. Neither will it use any more water for fire protection. Consequently, since a city is bound to furnish adequate protection, and since additional hydrants beyond the number absolutely necessary to furnish adequate protection do not add to the expenses of the utility, it follows that the city should pay all of the cost of fire protection through hydrants and there should be no charge for private fire hydrants. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 568.

105. There may be objection to charging all of the cost of hydrant fire service to the city, on the ground that the parties receiving fire

protection through privately owned hydrants are not paying enough to the city in return for the protection, but if this is the case, we believe that it is a matter which should be settled between the city and the private parties. It seems to be well established that the city should pay for all such fire protection, and the relations between the private parties and the city do not affect the justice of such a method of charging. From the argument as outlined above, it appears that in making rates for service to be rendered in the future little or no consideration should be given to private hydrants. What may be called "outside" fire protection, or such protection as should be furnished through hydrants, should generally be furnished by the city. The water company merely sells its service to the city and the city, in turn, furnishes fire protection. The city should, as a rule, pay the entire cost of such service, and the utility should not be allowed to sell service of the same kind to private parties, if by so doing it may produce a condition such that it may be unable to meet the demands of the city. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 569.

106. There should be no charge for private fire hydrants, except such as is included in the general charge to the city for fire protection. *(In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 655.

Flat rates.

107. The success of a flat rate plan, of course, depends very largely upon the attitude of the public towards the utility. If consumers are careful and reasonable in their use of water, a flat rate system may meet with some degree of success. As soon as any user of water becomes unreasonable in his use, however, or allows the water to waste, the flat rate system breaks down in its application to that user. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 545.

108. Under a flat rate system the charge per fixture installed is supposed, whether rightly or not, to be sufficient to pay for the amount of water which would ordinarily and reasonably be used through that fixture. If the consumer allows his use of water to run above the limit of reasonableness he is getting more of the product of the utility than he is paying for. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 545.

109. After all, the flat rate plan represents, although in an exceedingly imperfect and unsatisfactory manner, an attempt to charge the consumer for what he uses, the rate for each class of fixtures being partly based upon the cost of furnishing the amount of water which would reasonably be used through such fixtures. When the use exceeds a reasonable one, unless the utility has some means of checking the waste, it may easily and often does become out of all proportion to the actual needs of the service. Then, if the utility still derives sufficient revenue, consumers who are wasteful are shifting a part of the cost of their water supply upon more careful patrons, and if the revenues are insufficient the utility is furnishing a product for which it secures nothing. From what has been said it seems clear that the flat rate plan can be a success only in cases where the use of water through any fixture is a reasonable one. When the use exceeds a reasonable one, the nature of the fixture is no longer any index, however imperfect, of the amount of water used, and at this point some more definite and certain system of measurement must be used. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 545–546.

110. It seems to be well established that there is a very general waste of water under a flat rate plan. If all of the waste and unnecessary use of water were uniformly distributed among the consumers, a flat rate plan would not be unjust as between consumers. Where a given consumer is unusually wasteful, however, or where the character of the fixtures which he has installed, or the use which is made of those fix-

tures is such that the reasonable amount to be used cannot be approximately determined, it is unjust both to the users of water and to the utility to allow such a consumer to continue on a flat rate basis. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 546.

111. The flat rate method of charging for water leads to waste and excessive use. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 660.

112. In order to arrive at a system of flat rates which may be just to both the utility and the public, it is necessary to estimate as nearly as possible the amount of water which is used by the various classes of consumers other than those who pay for water on a meter basis. In making this estimate, the first step is to determine how much water is being used for various purposes from which the utility derives no revenue. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 668.

113. When the charge is made upon a flat rate basis, the very fact that the amount to be paid depends upon the fixtures and not upon the amount of water used, makes it extremely difficult to fix rates which shall correspond to the cost of service and make each consumer pay his proper share of the expenses of the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 669.

114. There can be no justification for an extension of the flat rate plan when the utility is financially able to install meters, and when the conditions under which water is to be used are such that meters may be advantageously placed. *City of Janseville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 671.

115. As there is no way of knowing how much water is used by any fixture or by any consumer on a flat rate basis, no readjustments of rates can be made which will bring the revenues from each consumer into line with the cost of his service. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 675.

116. The whole flat rate plan is inherently defective, in that it takes little or no cognizance of the cost principle, its chief end being to produce a sufficient amount of revenue, with charges, theoretically at least, based on the consumer's ability to pay. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 682.

Hydrant rental.

See ante, Fire protection rates.
See post, Street sprinkling and sewer flushing rates.

Making rates—Elements considered.

117. Unfortunately the water utility field is marked by an absence of reliable and satisfactory data. Although old in the number of years of service, this business has not furnished records of operating conditions and influence affecting it except in the most general conclusions. Statistics which are at all reliable, showing an installation of water fixtures, consumption data, leakage information, classes of consumers, etc., all of which elements vitally affect the rates, are very difficult to obtain. Even where data are available, the results must be used with great caution, since they are affected largely by the character of the population of the respective cities, climate conditions, industrial and social conditions and other factors, so that frequently the value of such information is greatly diminished for comparative purposes. This absence of record information makes necessary frequent resort to estimates, which, regardless of the most careful computation, give rise to an element of uncertainty. *(City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 72.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 306.

118. Under the law it appears to be the duty of the Commission to take all the elements of cost as well as the local conditions into account in passing upon any given schedule of rates. *(In re Appl. Manitowoc G.*

Co. 1908, 3 W. R. C. R. 163, 174–176.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339.

Making rates—Elements considered—Cost of service.

119. If it cost more to carry some customers than it does others, may it not be discriminatory to charge all the same rate? It would seem so. At any rate it is not easy to discover really valid arguments to the contrary. While no rates should be higher than the value of the service for which they are paid, it is by no means certain that it would be fair to levy the same rates on all, regardless of the cost. Such policy, besides being inequitable, invariably tends to discourage large scale consumption. *(In re Appl. Manitowoc G. Co.* 1908, 3 W. R. C. R. 163, 174–175.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 338–339.

120. As the cost of production per unit depends very largely upon the amount produced, decreasing as the volume of production is increased, and vice versa, it usually does not require much of a falling off in the sales to so increase the cost of production per unit as to even more than offset all advantages that the small consumers may derive from being placed on the same rate basis as the large consumers. The greater the consumption is, the lower is also the cost of production. Low cost of production, in turn, means low rates. It may be more equitable, as well as better business, to secure low rates for smaller consumers through extensions of the business than by serving them for less than cost, thereby throwing the deficits from this source upon the rest of the consumers. Large scale consumption should, therefore, be encouraged whenever it can be so encouraged in an equitable and legitimate manner. *(In re Appl. Manitowoc G. Co.* 1908, 3 W. R. C. R. 163, 175.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339.

121. It often happens that it is better, both for the plant and for all of its customers as well, that large quantities of the products should be sold at even less than enough to yield the regular rate of profits upon the same, than that these quantities should not be sold at all. *(In re Appl. Manitowoc G. Co.* 1908, 3 W. R. C. R. 163, 175.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339

122. The same rate for all is a term that is often much more beautiful in the abstract than when concretely applied. When it stands for the same rate for all regardless of both the cost and its effect upon the growth of the business, it may be in violation of sound, economic and business theories as well as of public policy. While there may be places where the conditions are such that uniform rates will fairly meet the situation, such places are not frequently met with. *(In re Appl. Manitowoc G. Co.* 1908, 3 W. R. C. R. 163, 175–176.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339.

123. It is seldom safe to adjust the rate schedules of a plant without reference to the cost of furnishing the service and without regard to the effect of such adjustment upon the developments of the business. *(In re Appl. Manitowoc G. Co.* 1908, 3 W. R. C. R. 163, 176.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339.

124. It is clear that large scale consumption should be encouraged and there are, no doubt, instances where customers cannot be had at the regular rates, and where it might be good business for the plant and to the best interest of the rest of the consumers to make some concessions in the rates, at least for a limited period, but there is great danger and it quite often happens that rates are put so low as to throw a burden on the other customers. *(In re Menominee & Marinette Lt. & Tr. Co.* 1909, 3 W. R. C. R. 778, 898.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 339.

125. To put a rate schedule into effect for permanent use, which is so low as to hardly cover the output costs, or that yields so little in the way of revenues as to leave little or nothing for interest, depreciation and taxes, would seem to be out of line with sound business practice,

and discriminatory as against other customers. *(In re Menominee & Marinette Lt. & Tr. Co.* 1909, 3 W. R. C. R. 778, 898.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 340.

126. In view of the facts in the present case the Commission must insist that the large users of water service be required to carry their fair share of the cost of service, and that the private consumers shall not be required to pay a part of the cost of service to the large users. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 341.

Making rates—Elements considered—Cost of service—Economies in operation.

127. It is expected, and is quite generally found to be the fact, that in combined plants the rates of general expenses or management costs will be less than in the case of single utilities or plants operating a water, gas, electric, or electric railway property alone. A combination of utilities, such as this case presents, may offer many opportunities for economies not possible in a single utility. Where such economies are made possible, it would appear that while the public is entitled to some share in such benefits as may result from such economies, at the same time the company is entitled to a reward for effecting the results described. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 285.

Making rates—Elements considered—Cost of service—Managing ability.

128. In fixing rates for public utilities consideration should be given to extraordinary efforts on the part of the management in extending the use of the services of the plants. Such extensions subserve the best interests of both the plants and their customers, and when due to initiative and enterprise on the part of the managment an allowance should be made for it in the way of extra profits. Such enterprise is of the nature of good will, but it is so fluctuating and uncertain that it should not be capitalized. It is a matter, however, that should receive due consideration in rate making, for it constitutes the main incentive to efficient management. In the long run low rates are more dependent upon the extension of the business and good management than upon anything else. To encourage such extension and such management, therefore, is in line with sound practice. *(Hill et al. v. Antigo W. Co.* 1909, 3 W. R. C. R. 623, 725.) *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 516.

129. It was argued by the company in support of the salaries paid in the present case that the time of the president is worth $25 per day. Without attempting to determine at this time whether or not this value is correct, it should be pointed out that the value of their time to the general officers themselves may be entirely different from its value to the utility. The value of a man's services and time to himself would ordinarily be judged by what he could dispose of them for, but the value to the utility must be judged by the results obtained. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 646.

130. It may be claimed that the management, if it desires, may choose between profits and a high operating cost, and that only the stockholders are interested as to whether a certain amount of income is retained for dividends or expended for management. But even if the public be not interested in the apportionment of a given sum between dividend and management cost, yet they have clearly an interest when the combination of such costs is unreasonably large. (Petition against Leominster G. Lt. Co., Mass. G. El. Lt. Comm. 25 Ann. Rep. 1910, 13, 15–16.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 647.

131. The amount which should be considered a reasonable expense for salaries must be determined by an examination of local conditions and by comparison with other plants which are similarly situated. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 648.

Making rates—Elements considered—Cost of service—Output, capacity and consumer costs.

132. The determination of the proper charge to the public for fire service rests largely upon the matter of investment. The amount of water used has practically no effect on the final result, as the quantity consumed for fire service is practically negligible. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 336.

133. The elements affecting the cost of fire service in the present case are: The total investment in the plant, the proportion of that investment made necessary by fire service, the total operating expenses of the utility, the proportion of these which is a fixed expense and the maximum demand for fire service. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 539.

134. A water plant located in a small city and supplying both fire and general service will usually have a larger part of its investment due to fire service than a utility in a larger city, due particularly to the increased size and weight of mains made necessary. The power plant and pumping equipment and source of supply must be adequate to meet the demand put upon them if the utility is to comply with the fire test so that if the fire test calls for an unusually large supply of water, the investment will be affected by this fact. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 540.

135. As far as pumping station investment and expenses are concerned, it is little, if any, cheaper to meet a large demand for water for fire protection in a small city than in a much larger one. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 541. .

136. A comparison of the cost of fire service per hydrant with cost per hydrant in other cities is not a satisfactory test of reasonableness, even when costs of pumping, distribution, etc., are the same. Cost per hydrant is not a correct unit, at least not when considered by itself, for the reason that the cost is influenced to a very large extent by the fire test which the utility has to meet. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 541.

137. Meter and fittings department labor is an item of expense which should be borne by the utility, regardless of the ownership of meters and services. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 644.

138. The cost of maintaining meters is an item which varies so greatly with local conditions that it is not practicable to fix in advance what the cost of such maintenance will be. It depends upon climatic conditions, upon where meters are set, upon the amount of sediment in the water, and upon other factors. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 644.

139. Before a rate can be made for metered consumers, it is necessary to take account of the meter reading expense, interest and depreciation on meters and services, and that portion of the expenses which are directly due to the general service, which should be borne by metered consumers. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 663.

140. In making a schedule of rates, it is not practicable to distinguish between users of the same class who have service connections of different sizes, as, for example, between two residences of six rooms each, each with a single faucet, but one of which has a larger service pipe than the other. This does not mean that capacity expenses should not be apportioned among the individual consumers on the basis of their

demands, just as much as this should be done in the case of consumers on a meter basis, but to distinguish between consumers of the same class would merely add one more element of complication to an already involved and unsatisfactory schedule. In general, consumers of the same class have services of uniform size, which eliminates any injustice which might be involved in neglecting the size of service as an element affecting the rate schedule, although there are many exceptions to this rule. Where injustice cannot be prevented under a flat rate plan, the obvious remedy is to use meters. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 670.

Meter rates.

141. Where conditions of building and climate are such as to admit of easy and economical introduction of meters, and where the utility is financially able to install meters, it does not admit of argument that the meter basis is the correct basis on which to sell water. This is especially true in cases where the premises supplied are connected with sewer, cess-pool, or drain, where the waste of water may be very great. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 546.

142. It is the duty of the utility to install meters at its own expense and sell its product on a meter basis, unless exempted from so doing by the Commission. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 549.

143. In establishing a meter rate in a case where a relatively small part of services are metered, it becomes necessary to fix a rate which will yield a reasonable revenue, taking into consideration the fact that the use of meters decreases consumption. A meter rate appears to be just if it is a rate which would be satisfactory with all services metered. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 660.

Public buildings, rates.

144. The city should pay for water used for other than protective purposes in the same way as an individual or a corporation would be expected and required to pay for a similar use. There appears to be no reason why a water supply company should be required to furnish water free to public buildings and schools, and for other public uses, and attempt to make up for this by additional charges to private consumers. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 558.

145. Public buildings, schools and churches should be charged for water on the same basis as other consumers. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 671.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service.

146. The most important factor in determining the rate of charge is the cost of service. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 256.

147. Rates for the services rendered by public utilities should very largely be based upon the cost to the plants of furnishing the services. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

148. Cost of service is not the only element upon which reasonable rates depend, but in most cases it is the most important element. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

149. Cost of service includes not only the ordinary expenses of operation of the plant, but also includes the items of taxes, depreciation, and interest and profit on investment. Since rates must be controlled largely by the cost and several of the principal elements of cost are im-

mediately affected and determined by the investment, it is at once apparent that the determination of reasonable rates is largely a matter of investigation of the operating expenses and the investment. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 287.

150. Reasonable rates can only be based upon normal and reasonable cost of service, which means that the operating expenses and the investment should be normal and not excessive, in view of the conditions under which the utility must be operated. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 288.

Reasonableness of rates—Matters considered in determining reasonableness—Cost of service—Equipment rental.

151. The Public Utilities Law expressly prohibits a utility from charging a consumer who owns his equipment, or any portion thereof, a lower rate than that paid by consumers who do not own such equipment, but provides that in case a consumer owns his equipment the utility may pay him a reasonable rental for its use. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 637.

152. Some of the services and meters are owned by the utility in the present case, and some by consumers, but it is clearly the intent of the law that all should be charged alike for equivalent service. In the case of meters and services which the company owns, the revenue must be sufficient to pay interest and provide for depreciation of the meter and service in addition to paying a proper share of plant expenses. As no lower rate can be made to consumers who own their meters and services, the revenue from such consumers must also be sufficient to provide for interest and depreciation. Any injustice from this can be avoided by having the company pay a reasonable rental for the services and meters which are owned by consumers, which reasonable rental would be about equivalent to interest and depreciation upon investment made by consumers in supplying what might be regarded as a part of the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 637.

153. According to the provisions of the Public Utilities Law, the company is obliged to charge all consumers the same rate, regardless of the ownership of the equipment and is allowed, in return, to pay a reasonable rental to consumers who own the equipment. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 657.

Reasonableness of rates—Matters considered in determining reasonableness—Relation between investment and growth of business.

154. In determining the reasonableness of rates careful inquiries should be directed to determine the relation between the investment line and the growth of business line at the particular period or year upon which the determination of the cost of service and, therefore, the rates are to be determined. For it is evident from these considerations that if the rates are computed upon the return on an investment which is taken at a point where the investment line is considerably above the business line, that, what appear to be reasonable rates at that point, may prove to be unreasonable and excessive at a point several years further on. Or, on the other hand, what may appear to be reasonable rates when the investment line has fallen below the the business line, may prove to be much lower than sufficient to produce a revenue which will give a reasonable return on the investment a year or a few years later when the investment will have to be materially increased in order to meet the demands of the business. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 289–290.

Reasonableness of rates—Meter rental—Paid by utility to consumer.

155. A reasonable rental would be about equivalent to interest and depreciation upon investment made by consumers in supplying what might be regarded as a part of the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 637.

156. Since the company in the present case is allowed to earn a return on all meters, justice to those consumers who own their services and meters would seem to require that they should receive a rental from the utility sufficient to meet the expense of interest, depreciation and taxes, as provided for in the earnings of the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 678–679.

Reasonableness of rates in particular cases.

157. The city of Beloit, petitioner, alleged that the rates for water charged by the respondent the Beloit W. G. & El. Co. were excessive and yielded an unreasonable return upon a fair valuation of the property; that respondent unlawfully and unreasonably discriminated in its charges for service in favor of certain large water consumers; and that its rate schedules were generally discriminatory and inequitably distributed the cost of service between the several classes of consumers. A valuation of the property was made and the revenues and expenditures were investigated. It was found that the water department of respondent's business was not earning more than a 7 per cent rate for interest and depreciation on the present value of the physical property. It was also found that the city was not paying its fair share of the total cost of the service incurred by reason of the fire service and public use of water, and that certain large consumers were paying less than the cost of the service rendered them. The development of the company's business is comparatively poor. This has been shown to be due largely to the design of the rate schedules. Large users have been encouraged by rates which were so close to, if not below, the actual cost of production, as to make it necessary to burden the smaller consumers with high rates in order to secure a reasonable return upon the investment as a whole. This policy has, in turn, tended to discourage the small users and has prevented a reasonably good saturation of territory and that development of the business which would justify the investment made and reduce the unit cost, and thereby the rates for service. *Held:* In view of all the facts, it is obviously unreasonable and unjust to the respondent to cause a material horizontal reduction in its rates for water service at this time. However, the present rates, as a whole, are somewhat higher than warranted under the circumstances, and they are not as equitably adjusted as they should be. Operating costs should be equitably distributed among the several classes of consumers and rate schedules so constructed as to make each class bear its just share of the total cost of service. Only thus can discrimination between consumers be avoided, the business be developed, and the interests of both the public and the company be best served. The respondent is ordered to discontinue its present schedule and to place in effect the rates provided by the Commission. The metering of water consumers, the development of the business which will come under the new schedules ordered, and the adjustments between classes will undoubtedly bring lower unit costs. After a year's operation under the new schedule the Commission will again review the facts and the situation may then reveal conditions which will make possible further adjustments and reductions. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 335, 379–383.

158. Application was made by the Oconto City W. Supply Co., a public utility furnishing water in Oconto, Wis., for an order fixing

rates. Previous orders of the Commission in the matter furnished the applicant a basis for making its charges pending the final order of the Commission, and made the rates for private consumers as established by this decision the legal rates, after Jan. 1, 1909, instead of the rates prescribed by the franchise. (5 W. R. C. R. 691, 694.) A valuation of the property was made, and a comparison with other utilities was made of investment per hydrant, per commercial service connection, per million gallons pumped, and per mile of main. The revenues and expenditures were investigated and apportioned as between the fire and the general service. It appears that the city has not been bearing its fair share of the expenses of the plant under the old schedule of rates. *Held:* Owing to the ease with which flowing wells may be obtained in Oconto, the company is to a certain extent engaged in a competitive business, and for the best interests of itself and the public it must accept a return somewhat less than usual. The company is ordered to discontinue its present rates and to put in effect the rates approved by the Commission. When meters are installed as ordered and the plant operated for some time under the rates prescribed, the Commission can make such revision as seems necessary to correct any defects in the rates as ordered. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 539, 543, 576–578.

159. The petitioners alleged that the rules, regulations and rates of the Janesville W. Co. are unreasonable, unjust and exorbitant. Subsequent to the filing of the petition the respondent changed a number of its rules and removed some of the causes of complaint. A valuation of the property was made and the revenues and expenditures were investigated and apportioned among the different branches of the service. *Held:* Certain modifications should be made to bring the rates more into line with the cost of service. The respondent is ordered to change its schedule as provided by the Commission. The changes ordered include a material increase in the amount to be paid by the city for fire protection and sewer flushing. Except for slight changes the flat rates are to remain as at present. The meter rates as fixed provide for a material reduction. All water used in schools, public buildings, churches, etc., is to be paid for at the schedule rate. The rates ordered are tentative in nature. After meters are in general use, it may be that changes in the amount of water used and in the operating expenses will necessitate a revision of the rates. If this situation arises, the Commission will be ready to make such modifications as appear necessary. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 705–706.

Regressive rates.

160. The most evident defect of the old schedule in the present case is its regressive feature. Instead of charging all consumers alike for the first 500 gallons used per day, for example, the company has charged a consumer who used 400 gallons per day 35 cts. per 1,000 gallons, but a consumer whose use amounted to 600 gallons per day was charged 30 cts. per 1,000 gallons for the entire amount, instead of 35 cts. per 1,000 for the first 500 gallons per day. The result of this has been to enable a consumer to use a larger amount of water at a total cost less than the cost of a smaller amount. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 666–667.

Sewer flushing rates.

See Street sprinkling and sewer flushing rates.

Street sprinkling and sewer flushing rates.

161. The public uses of water for sewer flushing, street construction work and street sprinkling should be charged with and pay their share

of the expenses of general service. The use for flushing purposes, for street construction work, and for street sprinkling may be considered "off-peak." That is, these are uses of water which do not occur at times when the maximum demand, consisting of the demand of domestic and industrial users and the heaviest demand for fire purposes, is being exerted. These are, therefore, uses which do not greatly influence the required capacity of the plant, and may therefore be charged with less in the way of capacity expenses than other uses. Of course, if the city actually uses water for these purposes during the time of a large fire, the rate for water so used should include a portion of the capacity expenses. It appears to be only reasonable, however, to require the city to discontinue the use of water for these purposes during times of fire, and it would appear to be to the interest of the city to do so, as this makes the correct charge for the water used very much lower than it would otherwise be. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 558-559.

162. A proper payment for water used for sewer flushing and for street sprinkling appears to be an amount sufficient to cover at least the output costs. These demands are entirely off-peak, if the co-incident peak formed by fire and general service is considered, in that no water is, or need be, used for these purposes at times when a large fire demand is exacted. If the general service only is considered, sewer flushing and street sprinkling undoubtedly do affect the maximum demand of this service, but as the plant is designed to carry both the fire and the general demands, it is equitable to apportion capacity expenses only to those classes of service which may affect the simultaneous peak. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 671.

RATIO OF DEMAND TO CONNECTED LOAD

Load factor for electric utilities, *see* RATES, 8, 19.

REASONABLE RETURN

See RETURN.

REASONABLENESS OF RATES

See RATES.

REBATES OR CONCESSIONS

Limitation of statute, in reparation proceedings as safeguard against rebates or concessions, *see* REPARATION, 11.

Allowance to customer of public utility on account of ownership of instrument or facility—Rate concession prohibited.

1. The Public Utilities Law expressly prohibits a utility from charging a consumer who owns his equipment, or any portion thereof, a lower rate than that paid by consumers who do not own such equipment, but provides that in case a consumer owns his equipment the utility may pay him a reasonable rental for its use. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 637.

2. Some of the services and meters are owned by the utility in the present case, and some by consumers, but it is clearly the intent of the law that all should be charged alike for equivalent service. As no lower rate can be made to consumers who own their meters and services, the revenue from such consumers must also be sufficient to provide for interest and depreciation. Any injustice from this can be avoided by having the company pay a reasonable rental for the services and meters which are owned by consumers, which reasonable rental would be about equivalent to interest and depreciation upon investment made by consumers in supplying what might be regarded as a part of

the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 637.

3. According to the provisions of the Public Utilities Law, the company is obliged to charge all consumers the same rate, regardless of the ownership of the equipment, and is allowed, in return, to pay a reasonable rental to consumers who own the equipment. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 657.

RECOVERY

See REPARATION.

REDUCTION OF RATES

Reduction of rates not to be construed as an admission of prior unreasonableness, *see* REPARATION, 6.

Reduction on account of the furnishing of facilities by consumer prohibited, *see* RATES, 151–153.

REFUNDS

Refund from charges collected, *see* REPARATION, 13–21.

REGRESSIVE RATES

Regressive rates for water utility, *see* RATES, 160.

REGULARITY OF MOVEMENT

As element considered in making railway rates, *see* RATES, 43.

REGULATIONS

See RULES AND REGULATIONS.

REHEARING

See PROCEDURE.

Proceedings before Commission, rehearing upon original petition subsequent to vacation of order by court, *see* PROCEDURE, 3.

RELATION OF RATES

See RATES.

RENTAL FOR EQUIPMENT

As matter considered in determining reasonableness of electric rates, *see* RATES, 151–153.

REPARATION

IN GENERAL

Overcharges collected in accordance with published rate.

1. When the Railroad Commission Act was passed in 1905, it contained no provision for making reparation upon past shipments of freight in case of an exorbitant or unusual rate being reduced by the Commission. So, in 1907, the legislature enacted sec. 1797—37m (ch. 582) as an amendment to the original act (ch. 362) of 1905. This amendment became effective July 12, 1907 and shortly thereafter several claims were filed with the Commission seeking reparation upon shipments which had been made prior to that time. The Commission decided that it was without jurisdiction to consider any claim for reparation which did not come within the scope of the amendment. Subsequently the legislature enacted ch. 271, Laws of 1909, which conferred power upon the Commission to authorize refunds on certain accrued claims. The period for filing such claims was limited to 30 days and

the statute, by its terms, expired at the end of that period. At the time sec. 1797 37m passed in 1907, it was regarded as a statute of limitations, and therefore, in enacting ch. 271, Laws of 1909, the legislature was cautious not to undertake to create any liability on the part of the railroads as to claims which might be barred by such section. Accordingly under ch. 271 (sec. 1797–12a) the railroads were merely exempted from the penalty of the general statute if reparations were made by them upon the finding of the Commission. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 780–781.

GROUND FOR RECOVERY.

Question of reasonableness of rate, dependent upon conditions.

2. The changing of a rate by the Commission because the same is found to be unjust and unreasonable, does not render such rate unjust and unreasonable *ab initio.* (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

3. A finding that a rate is exorbitant or unusual at any given time is not a condemnation of such rate for any other time previous thereto. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 779.

4. It needs no demonstration to comprehend that rates which may be entirely reasonable under existing conditions may become unreasonable when such conditions change. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 779.

5. Merely because the Commission finds upon investigation that a rate is unusual or exorbitant, the presumption does not arise that the rate was unreasonable at any time preceding the period of investigation by the Commission. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 779.

Reduction of rate not to be construed as an admission of prior unreasonableness.

6. The awarding of reparation by no means necessarily follows the reduction of a rate, whether by the voluntary action of the carrier or by order of the Commission. (*Andarko Cotton Oil Co. v. A. T. & S. F. R. Co.* 1910, 20 I. C. C. R. 43, 50.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 779.

Special rate to manufactures not basis of recovery for other shippers.

7. The fact that the rates to manufacturers were lower at the time of the shipments in question than the rates to coal dealers at the same points, cannot be made the basis for a refund. *South Milwaukee Fuel & Supply Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 1, 7.

JURISDICTION OF COMMISSION.

Authority of Commission in awarding reparation.

8. The jurisdiction of the Commission in reparation cases being limited to a six months' period, it cannot investigate the reasonableness of the charges made at any time previous. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778, 779.

JURISDICTION OF COURTS.

Jurisdiction in cases involving overcharges upon which the limitation of the statute has run.

9. While it was conceded that under sec. 1797—37m of the statutes, the jurisdiction of the Commission in reparation cases is limited solely to claims arising in relation to shipments made within six months

prior to the filing of a petition for a refund, it was contended by the petitioner that in an action at law to recover any overcharge found by the Commission to have been made by the carriers on such shipments as reached their destination within the period of six months, such limitation in no wise operates as a bar to that portion of the claim which relates to shipments made at any time previous to the six months period. *Held:* The effect of this statute upon transportation charges eliminated from consideration in this proceeding by its express terms is a matter for judicial decision. However, it may not be inappropriate under the circumstances to express the view of the Commission that no action can be instituted to recover any alleged overcharge exacted by the carrier until the Commission has condemned under the statute the charge actually collected. Since the jurisdiction of the Commission is limited to a six months period, it cannot investigate the reasonableness of the charges made at any time previous, and a finding that a rate is exorbitant or unusual at any given time is not a condemnation of such rate for any other time previous thereto. If the contention of the petitioner were valid, rates might be changed contrary to the manner provided by statute and it would come to pass that a shipper might obtain relief upon the basis that the established rate was unreasonable, in the opinion of a court and jury, and thus such shipper would receive a preference or discrimination not enjoyed by those against whom the schedule of rates was continued to be enforced. Indeed, the recognition of such a right is wholly inconsistent with the administrative power conferred upon the Commission and with the duty, which the statute casts upon that body, of seeing to it that the statutory requirement as to uniformity and equality of rates is observed. (*Texas & Pacific R. Co. v. Abilene Cotton Co.* 1907, 204 U. S. 426, 440.) The Commission is constrained to hold that the act of 1905 superseded the common law and that the amendment sec. 1797—37m to the act is not merely remedial in its character, nor does it merely give a remedy for an existing right. It confers the right and provides the remedy to enforce it. The contention that section 1797—37m did not bar the common law remedy, is not valid. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 776–778

LIMITATION OF STATUTE.

Computation of period of limitation.

10. Any informal complaint relative to any overcharge upon shipments of freight has always been regarded both by the interstate commerce commission and this Commission as sufficient to stop the running of the statute of limitations upon the claim. In such instances, although formal petition under the rules of practice of this Commission may not have been filed until after the limitation provided in the statute has expired, the Commission has considered that the informal complaint to the Commission stopped the running of the statute, and therefore reparation has been awarded in such cases. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461–462.

Purpose of limitation.

11. The difficulty of ascertaining all of the facts essential to a decision of the question in a reparation case for any length of time in the past, and the danger for this reason of again opening the door to the practice of rebating, doubtless influenced the legislature in limiting the scope of the investigation to such shipments as reached their destination within a period of six months, now one year, before complaint is made. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 779.

PROCEDURE BEFORE COMMISSION.

Complaint against carrier for reparation.

12. According to the usual practice of the Commission the matter of refunds is determined in a separate proceeding based upon a formal petition therein. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461–462.

REFUNDS.

Refund from demurrage charge accrued through negligence of carrier.

13. Petitioner prays for refund of demurrage charges accrued on a car of lumber at Stoughton, Wis. The car was refused by the original consignee and was reconsigned to another party in Stoughton. It appears that the agent at Stoughton made but little if any effort to secure the release of the car without the accrual of demurrage. *Held:* The agent of the respondent was negligent in not properly looking after the final disposition of the car. Under the circumstances the demurrage charge was erroneous and not justified. Refund is ordered. *G. W. Jones Lbr. Co. v. C. M. & St. P. R. Co.* 1911, 7 W. R. C. R. 388, 391.

Refund from excess charge based on rates higher than the rates prevailing under substantially similar conditions, and also higher than the cost of transportation warrants.

14. Petitioner, in behalf of itself and other coal merchants in Cudahy and South Milwaukee, alleges that these stations, located seven and ten miles, respectively, from Milwaukee, are terminal points on respondent company's line, and that the rates on coal, coke and similar shipments from Milwaukee to Cudahy and South Milwaukee are higher than such rates to other terminal points in and about the city of Milwaukee; that such rates are unreasonable and discriminatory; that manufacturers at the various terminal points in and about Milwaukee enjoy lower rates on different commodities in carload lots than are available to persons not manufacturers; that the rate on coke from Chicago to South Milwaukee and Cudahy is 45 cts. per ton, and that the same rate is exacted from Milwaukee to those points, for one-tenth of the distance; and that the rates on coal between Milwaukee and South Milwaukee and Cudahy are now 35 and 40 cts. per ton, as against a former rate of 25 cts. Petitioner prays that refund be made to itself and the other dealers involved for all shipments which moved in the six months preceding the filing of this petition. Respondent company had prepared a new tariff, which had been published but was not yet effective at the time of the hearing, which remedied these discriminatory conditions by placing all manufacturing districts in and about Milwaukee upon practically the same rate basis, and which does not discriminate between manufacturers and other consignees. *Held:* Cudahy and South Milwaukee should be placed, as to the shipments upon which refund is asked, upon the same rate basis as other manufacturing districts in and about Milwaukee, and refund is ordered on 224 of the 257 freight bills submitted by petitioner and the other coal merchants referred to, on the basis of $5 per car for Cudahy, and $6 per car for South Milwaukee, 50,000 lbs. minimum, excess at proportionate rates. The amounts mentioned herein are subject to change insofar as it may be found that respondent has absorbed switching charges, or that error has been made in the calculation. *South Milwaukee Fuel & Supply Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 1, 9–11.

Refund from excess charge caused by failure through inadvertence to put in legal effect a lower rate subsequently made effective.

15. Petitioner alleges overcharges on various shipments of vehicles and agricultural implements from Milwaukee to different points in Wisconsin. The rate contended for was inadvertently omitted from the schedule but was put in effect after the shipment moved. *Held:* The rate charged was unusual and exorbitant and a reasonable charge for the services rendered would have been a rate of 18 cts per cwt., as subsequently made effective. Refund is ordered. *Lindsay Bros v. M. St. P. & S. S. M. R. Co.* 1911, 7 W. R. C. R. 17, 18.

Refund from excess charge ordered on basis of reasonable rate previously established by order of the Commission.

16. Complaint was made of unusual and exorbitant switching charges on 490 cars of grain switched from the connection of the respondent's line with that of the M. St. P. & S. S. M. R. Co. to the petitioner's mills in the city of Superior, Wis. A charge of $3.00 per car was exacted. In *Duluth-Superior Milling Company et al. v. N. P. R. Co.* 1910, 5 W. R. C. R. 598, it was held that a similar charge was unusual, as it was double the amount charged by other railway companies for a similar service within the city of Superior. It was also found that $1.50 per car would be reasonably compensatory for such switching service, and the charge was accordingly reduced to that amount. The conclusion there reached is controlling in the instant case. *Held:* The rate exacted was unusual and exorbitant, and a reasonable charge would have been the rate previously established by the Commission. Refund is ordered. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461–462.

Refund from excess charge ordered on basis of reasonable rate previously in effect and subsequently made effective.

17. Petitioner alleges overcharges on various shipments of logs from Marston Spur to Drummond, Wis. The rate contended for had been in effect before July 1, 1910, and was again made effective on Jan. 14, 1911, after the shipments had moved. *Held:* The charge exacted was unusual and exorbitant and a reasonable charge would have been based on the rate as previously in effect and subsequently reestablished. Refund is ordered. *Rust Owen Lbr. Co. v. C. St. P. M. & O. R. Co.* 1911, 7 W. R. C. R. 12, 13.

Refund from excess charge ordered on basis of reasonable rate subsequently made effective.

18. Petitioner alleges overcharges on shipment of seven cars of lumber from Ashland to Hayward, Wis. The rate contended for was put in effect after the shipment moved. *Held:* The rate exacted was unreasonable and a reasonable rate to have charged for the shipment would have been 2 cts. per cwt., in accordance with the tariff now in effect. Refund is ordered. *Edward Hines Lbr. Co. v. C. St. P. M. & O. R. Co.* 1911, 7 W. R. C. R. 14, 16.

19. Petitioner alleges overcharges on certain shipments of lime from Oakfield to Hackley and Mountain, Wis. Following the shipments, a change in classification was made, which had the effect of reducing a part of the rates in question. *Held:* The rates exacted for a part of the shipments were unusual and exorbitant, and reasonable rates would have been those subsequently established through the change in classification. Refund is ordered. *Standard Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 149, 151.

20. Petitioner alleged overcharges on a carload shipment of lumber from Goodman to Tomahawk, Wis. A manufacturer's rate of 6 cts. per cwt. had been agreed upon prior to the shipment, and was subsequently put into legal effect. *Held:* The local rate exacted was unusual and exorbitant and the reasonable rate would have been the rate subsequently made effective. Refund is ordered. *Brown Land & Lbr. Co. v. M. St. P. & S. S. M. R. Co.* 1911, 7 W. R. C. R. 581, 582

21. Complaint was made of excessive rates on shipments of lumber from Laona, Wis., to various points within the state. Subsequent to the shipments the rates in question were greatly reduced. *Held:* The rates exacted were unusual and the reasonable charges for the service rendered would have been the rates now in effect. Refund is ordered on the shipments reaching their destination within six months of the date of the filing of the petition. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 782–783.

Refunds ordered on specific shipments.

Refund of demurrage charges, *see ante*, 13.
Refund on shipment of agricultural implements, *see ante*, 15.
  of coal, *see ante*, 14.
  of coke, *see ante*, 14.
  of grain, *see ante*, 16.
  of implements, *see ante*, 15.
  of lime, *see ante*, 19.
  of logs, *see ante*, 17.
  of lumber, *see ante*, 13, 18, 20, 21.
  of vehicles, *see ante*, 15.

RETURN

Property employed in a public or quasi public enterprise—Owner entitled to reasonable return.

1. The law provides in substance that under normal conditions the carriers are entitled to such compensation for their services that their receipts from this source as a whole will cover the necessary operating expenses, including reasonable returns upon their investment. This does not mean that if the carriers are entitled to, say, 7 per cent for interest and profit above other operating expenses, the rates on each class of traffic or kind of commodity should be so fixed as to yield this amount. It simply means that this is the return that should be obtained from the traffic as a whole; that each class or kind of traffic should contribute to this return in proportion to the cost of transportation, modified by the value of the articles carried and other factors. When all the factors which enter into rate making are thus properly taken into account in making rates, it will be found that the rates on high priced articles yield much more than the average return and that the rates on low priced articles yield considerably less than the average return. Under ordinary conditions, however, no rate is or should be made so low that when all the elements are taken into account it is not found to yield enough to cover operating expenses, including something in the way of a return upon the investment. *Ringle et al. v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 170, 180.

Rate of return on investments in a public utility enterprise—Investment in advance of needs of community.

2. It would seem that when a utility undertakes to build considerably in advance of the needs of the community, the utility can hardly expect a large return upon this investment immediately. On the other hand, if consumers can be induced to pay a profit on this investment, it would appear advantageous for the utility to invest in equipment

which will meet demands far into the future. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 347.

Rate of return on investments in a public utility enterprise—Rate of return under abnormal conditions.

3. Undoubtedly the utility is entitled to a reasonable return upon the value of its property but if the attempt to enforce rates which will yield such a return is to lead to a decrease in the number of consumers and resulting decrease in revenues, any theories as to the proper return on property must give way to the practical situation. Considerable testimony was introduced to show that if rates fixed by this decision were as high as the franchise rates, still more of the present consumers would discontinue. That this would be the case, appears to be unquestionable. The fact that consumers will not pay a rate which will enable the utility to earn what would ordinarily constitute a reasonable rate of return upon its property, may not affect the justice of such a charge or the legal right of the utility to charge such rates, but the fact that the utility has a legal right to a reasonable return upon its property will not prove of much value if it loses a large part of its business because of the presence of competition or the inability of consumers to pay enough to ensure the company such a return. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 556–557.

What constitutes a reasonable return for public utilities—Return for interest and profits.

4. The profits simply consist of what is left after all other claims have been satisfied. They form a surplus over and above the expenses of operation or production, and constitute that part of the income which goes to those who carry on the business. (*In re Fond du Lac W. Co.* 1910, 5 W. R. C. R. 482, 506.) *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 100.

What constitutes a reasonable return for public utilities—Return for profits—Wages of management.

5. The amount which the utility shall pay to its general officers is a matter of policy which does not concern the public, but consumers have a very vital interest in the total return which the utility secures upon its investment. If the controlling stockholders choose to dispose of earnings in the form of large salaries, the minority stockholders may have interests involved, but so long as the total return on investments is reasonable, it is of no concern to the consumers whether earnings are disposed of in the form of salaries or in the form of dividends. The sole interest of consumers in this matter is to be assured that the total rate of return is reasonable. Just as far as salaries of general officers exceed a reasonable and just compensation for the time and services of such officers, these salaries should be regarded as a portion of the return on investment. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 647.

6. Although it makes no difference to the consumer whether a reduction is made in salaries or whether the reduction be in the amount to be returned in the form of dividends, consumers have a right to demand that the combination of salaries and interest shall not be unreasonable. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 648.

RISK

Risks involved in transportation as matter considered in determining reasonableness of rates for railways, *see* RATES, 58.

ROAD-MILE EXPENSES

Apportionment of road-mile expenses in the determination of unit costs for transportation, *see* ACCOUNTING, 14.

ROUTES

Alteration of route of railroad, *see* RAILROADS, 10.

RULES AND REGULATIONS

Enforcement of rules—Penalties for non-compliance—Withdrawal of service.

1. A rule providing that water shall be shut off for failure to comply with the rules and regulations of the company, and that a charge of one dollar shall be paid before the water is again turned on, is reasonable. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 683.

Requirements as to payment of rates for services rendered by public utilities—Payment of full amount by each party using common fixtures.

2. Objection was made to a rule providing that any fixture located in any public place will be rated for the full amount that would be chargeable to different parties having access to the fixtures at the same rates that would be charged if each of the parties had the same fixtures independent of each other. The basis upon which such a rule has generally been upheld is, that the charge is in the nature of a minimum charge, which may be made the same for each consumer. A strict adherence to the cost principle may not justify the practice as outlined by this rule, but as long as each consumer has the option of having fixtures in his own office at the same rate, no injustice appears to exist in the present system of charging. The proper extension of the system of metering would seem to furnish the best means of overcoming any difficulties which may arise. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 682.

Requirements as to payment of rates for services rendered by public utility—Regulations for discounts or penalties.

3. The Commission, on its own motion, investigated the complaint that the Northwestern Lt. & P. Co. furnishing electric current in Mayville, Wis., unjustly collected a 5 per cent prompt payment discount. *Held:* The collection of the 5 per cent discount in the present case was proper since petitioner did not pay his bill until two days after the last discount day. *In re Invest. of the Northwestern Lt. & P. Co.* 1911, 7 W. R. C. R. 59, 69–70.

4. In the present case the regulation that discount for prompt payment shall not be granted after the date set forth in the consumer's bill is reasonable. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 492.

5. If a suitable discount is offered for prompt payment, the net charge to consumers will be appreciably reduced at the same time that the company will be aided in securing prompt payment. In the present case, a discount of about 10 per cent for payment during the first month of the quarter would seem to afford consumers as great a reduction from present rates as warranted by existing conditions. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 573–574.

Requirements as to payment of rates for services rendered by public utility—Regulations for service charge when meter serves more than one customer.

6. Objection was made to a rule providing that where meters serve more than one tenant, each customer so served will be charged the full minimum rate. It was ordered that the rule be amended so that in such cases a service charge of $1 per quarter shall be made for each additional consumer. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 683, 707.

SAFETY APPLIANCES

Automatic crossing alarm for protection of railroad crossings, *see* RAILROADS, 1-2, 5.

SASH

Rates, establishment of joint rates, Wausau to Wisconsin points on M. St. P. & S. S. M. R. Co. (north of Hurley and west of Abbotsford to state line), *see* RATES, 42.

SCHEDULES

Railway rate schedules, *see* SCHEDULES OR TARIFFS.

SCHEDULES OR TARIFFS

See CLASSIFICATION; RATES; REPARATION.

CHANGE IN TARIFFS.

Authority of Commission to order changes in tariffs.

1. The only remedy provided for altering rates, when found by the Commission to be unjust and unreasonable, is that prescribed by the statute. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

Effect of change ordered by Commission.

2. Any change made by the Commission in any rates because they are unreasonable, only operates to make such rates unjust and unreasonable from the time of the taking effect of the new or substituted rates. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

DEPARTURE FROM PUBLISHED TARIFF PROHIBITED.

In general.

3. The rates of the carrier, filed and published as required by the statute, are the lawful rates, from which neither the carrier nor the shipper can depart. Such rates cannot be changed except by the Commission in the manner provided by the statute. *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 777.

4. All schedules of rates printed and filed as required by the act are legal and binding upon both shipper and carrier until changed by the Commission. (*Oshkosh Logging Tool Co. v. C. & N. W. R. Co.* 1907, 2 W. R. C. R. 116.) *Connor Land & Lbr. Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 774, 778.

SCOPE OF LAW

See PUBLIC UTILITIES LAW; RAILROAD LAW.

SERVICE AND FACILITIES

Bridges, toll bridges, requirements as to service and facilities, repairs for safety and convenience of public, *see* BRIDGES, 1.
Electric utilities, requirements as to service and facilities, adequacy of service, *see* ELECTRIC UTILITIES, 2.
  requirement as to service and facilities, appliances for the measurement of product or service, duty of utility to provide meters, *see* ELECTRIC UTILITIES, 1.
  standards of service, meters, accuracy of, *see* ELECTRIC UTILITIES, 2.
  standards of service, voltage, regulation of, *see* ELECTRIC UTILITIES, 2.
Gas utilities, requirements as to service and facilities, adequacy of service, *see* GAS UTILITIES, 1.
  standards of service, heating value, *see* GAS UTILITIES, 1.
  standards of service, meters, accuracy of, *see* GAS UTILITIES, 1.
  standards of service, pressure, *see* GAS UTILITIES, 1.
Jurisdiction of Commission over service and facilities of railroad companies, switch connections for intrastate commerce, *see* RAILROAD COMMISSION, 5.
Power of Commission to regulate service and facilities, of railroads, *see* RAILROAD COMMISSION, 2, 6.
Power of Commission to regulate service and facilities, of railroads, authority over private industrial tracks, *see* RAILROAD COMMISSION, 2.
Power of Commission to regulate service and facilities, of railroads, power to order operation of branch line where the carrier has failed to comply with the statutory provisions relating to branches and extensions, *see* RAILROAD COMMISSION, 6.
Railroads, duty of railroad company to perform service entailing pecuniary loss, *see* RAILROADS, 12.
Railroads, station facilities, adequacy of, *see* STATION FACILITIES, 1–2.
Railroads, station facilities, character of facilities, company to be permitted wide latitude in determining character of facilities, *see* STATION FACILITIES, 3.
Railroads, train service, adequacy of, *see* TRAIN SERVICE, 1.
Regulations as to payment of rates for services rendered by public utility, regulations for withdrawal of service, *see* RULES AND REGULATIONS, 1.
Street railways, requirements as to service and facilities, adequacy of service, *see* STREET RAILWAYS, 4–5.
Street railways, requirements as to service and facilities, extensions and additions, *see* STREET RAILWAYS, 1–3.
Water utilities, requirements as to service and facilities, adequacy of service, *see* WATER UTILITIES, 7.
Water utilities, requirements as to service and facilities, appliances for the measurement of product or service, duty of utility to provide meters, *see* WATER UTILITIES, 8–14.
Water utilities, requirements as to service and facilities, duty of utility to provide services, *see* WATER UTILITIES, 15–16.
Water utilities, requirements as to service and facilities, extension of mains, *see* WATER UTILITIES, 1–5.
Water utilities, standards of service, purity, *see* WATER UTILITIES, 17.

SERVICE CHARGE

See MINIMUM CHARGES.

SERVICE CONNECTIONS

As element in the valuation of public utilities, *see* VALUATION, 37–40.

SEWER FLUSHING RATES

See RATES.

SHIPPING FACILITIES

See Station Facilities; Switch Connections.

SIDETRACK FACILITIES

See Switch Connections.

SPECIAL CONTRACTS

See Contract of Shipment; Contracts.

SPECIAL SERVICE RATE

Special service rates, different rates for different classes of telephone service, *see* Rates, 81–88.

SPUR TRACKS

See Switch Connections.

STANDARD CARS

Relation of jimmy cars to standard cars, *see* Rates, 60.

STANDARDS OF SERVICE

Electric utilities, accuracy of meters, *see* Electric Utilities, 2.
 uniformity of voltage, *see* Electric Utilities, 2.
Gas utilities, accuracy of meters, *see* Gas Utilities, 1.
 standards for heating value, *see* Gas Utilities, 1.
 standards for pressure, *see* Gas Utilities, 1.
Water utilities, standards for purity, *see* Water Utilities, 17.

STATION FACILITIES

See also Switch Connections.

Adequacy of station facilities.

1. Petitioners allege that the depot facilities at Grantsburg, Wis., are inadequate. *Held:* The station is too small to meet the reasonable requirements of the public. The respondent is ordered to provide an adequate station building within ninety days. *Nelson et al. v. N. P. R. Co.* 1911, 7 W. R. C. R. 764, 769.

2. Petitioner alleges that the station facilities at Plymouth, Wis., are wholly inadequate and that the joint passenger station maintained by the C. M. & St. P. R. Co. and the C. & N. W. R. Co. is in a dilapidated and unsanitary condition. *Held:* New station facilities are required. The respondents are ordered to erect adequate passenger depots within nine months in accordance with plans to be submitted to the Commission. *City of Plymouth v. C. M. & St. P. R. Co. et al.* 1911, 7 W. R. C. R. 770, 773.

Character of facilities—Company to be permitted wide latitude in determining character of facilities.

3. Relative to the size and character of the building, we may say that the railway company is in a position to determine more accurately such matters than anyone else. All of these are factors regarding which the Commission has no definite knowledge, and even if it had this knowledge it would scarcely be justified in prescribing, with requisite detail, matters relating to such a thing as the construction of a railway station. We do not believe that in the present case we should prescribe the exact dimensions of the proposed station. That should properly be left, in the first instance, to the best judgment of the railway company, and if the kind of a station which the railway

company may construct should prove to be inadequate, the Commission will then entertain a complaint with reference to the same and render such a decision as the merits of the question may warrant. *(Licneman v. C. M. & St. P. R. Co.* 1907, 2 W. R. C. R. 88, 91.) *Nelson et al v. N. P. R. Co.* 1911, 7 W. R. C. R. 764, 768.

STATIONS

See STATION FACILITIES.

STOCK

See CAPITAL STOCK; LIVE STOCK.

STOPPAGE IN TRANSIT

See TRANSIT PRIVILEGES.

STORAGE FACILITIES

See STATION FACILITIES; SWITCH CONNECTIONS.

STREET RAILWAYS

ACCOUNTING.

See ACCOUNTING.

ESTABLISHMENT, CONSTRUCTION AND MAINTENANCE.

Extension of lines.

1. If the construction of an ordinary railway is contemplated between two designated terminal stations, the route to be occupied may perhaps be designated with reasonable certainty in its charter, but a street railway system intended for the use and convenience of a growing city for a long period of years presents a different problem. Of necessity, it must be a growth—a development—and the direction or number of the lines or tracks which will be required in the future cannot be foretold with any precision. New streets will be opened, new additions to the city will be laid out, and other changes not now anticipated will take place. To meet these contingencies, the city council, in granting a charter for a comprehensive street railway system, must either in sweeping terms grant the right to occupy all streets now or hereafter opened, or it must provide for the extension of lines from time to time as the need therefor may arise, and the city council direct. These provisions are not for the granting of new privileges or franchises, but for the reasonable regulation and control of the company in the use of the franchise originally granted. To adopt the other plan, and grant a franchise expressly allowing the company to enter upon and occupy any or all streets, without any power of veto or regulation by the city council, even if of any validity, would be a most unwise and impolitic abandonment of an important right. *(Thurston v. Huston,* 1904, 123 Iowa, 157; 98 N. W. 637, 639.) *City of Green Bay v. Green Bay Tr. Co.* 1911, 7 W. R. C. R. 715, 724.

2. It is to be conceded that a franchise for a street railway may be confined to any one or more streets or neighborhoods of a city, and if the terms of the grant, when fairly construed, indicate that such restricted or localized privilege was intended, then, of course, any extension of such railway into other streets or districts is subject to all the conditions pertaining to the grant of a new or independent franchise. It is a matter of common observation, however, that, outside of the very large cities, street railway franchises confined to a few streets or districts of the municipal territory are very rare; and, while exclusive franchises, except for limited periods, are not allowable, there can be found very few investors disposed to undertake the con-

struction and operation of a street railway system in our small cities, if the right to expand its lines to accommodate the growth and expansion of the city is denied, or if each successive extension of its track into another street involves the procurement of a new and additional franchise. *(Thurston v. Huston,* 1904, 123 Iowa, 157; 98 N. W. 637, 640.) *City of Green Bay v. Green Bay Tr. Co.* 1911, 7 W. R. C. R. 715, 725.

3. The present case involves the question of whether or not the petitioner can compel the respondent to fulfill the agreement of its predecessor to build and operate additional street railway trackage. The agreement was that such predecessor should remove certain trackage in the west side of the city and within a specified time build and operate an equal amount of trackage in the same section. An application was made to the common council for authority to construct a portion of such trackage. No action was taken by the council until several years later, after the expiration of the time specified and after such company had transferred its property to the respondent and had dissolved. *Held:* The refusal of the common council to act within a reasonable time was tantamount to a denial of the application. The application was for an independent franchise. At the time the respondent acquired the property no right was transferred to construct such line, and the attempted grant by the council was nugatory as the grantee was then no longer in existence. The respondent was not a party, either direct or indirect, to the transaction and is therefore in no wise bound to perform the obligation attempted to be created. The conclusion reached renders it unnecessary to consider other objections which are interposed to the validity of the alleged grant in controversy. The petition is dismissed. *City of Green Bay v. Green Bay Tr. Co.* 1911, 7 W. R. C. R. 715, 725, 726.

OPERATION.

Requirements as to service and facilities—Adequacy of service.

4. In arriving at the correct amount of service to be given by a street railway company on any line, it is essential to measure as closely as possible the amount of service unconsciously required by the public at all times of the day and under varying conditions. *Washington Park Adv. Assn. v. T. M. E. R. & L. Co.* 1911, 7 W. R. C. R. 19, 20.

5. Petitioner alleges that respondent's street railway service on the Walnut street line in the city of Milwaukee Wis., is irregular and inadequate. Data on file and information, gained by a number of observations of the traffic on the line involved, was analyzed. In the present case the traffic diversity factor of 15 per cent has been used in connection with all calculations made in determining the headway necessary to give adequate service. *Held:* Present service is inadequate. Respondent is ordered to establish a regular schedule on the line of eight minutes headway throughout the day and to add the extra cars during the maximum periods of travel, so as to reduce such headway during such periods to three minutes on the north side of the city, and to four minutes on the south side. *Washington Park Adv. Assn. v. T. M. E. R. & L. Co.* 1911, 7 W. R. C. R. 19, 26.

RATES.

See RATES.

VALUATION.

See VALUATION.

STREET SPRINKLING RATES

See RATES.

STUB TRACK

See Switch Connections.

SUBWAYS

For separation of grades at railroad crossings, *see* Railroads, 7–9.

SUPERINTENDENCE

Cost of superintendence as element in the valuation of public utilities, *see* Valuation, 32–34.

Wages of management and superintendence as element in profits, *see* Return, 5–6.

SWITCH CONNECTIONS

IN GENERAL.

Jurisdiction of Commission over facilities for intrastate traffic. *See* Railroad Commission, 5.

CHARACTER OF SWITCH CONNECTIONS.

Private industrial tracks.

1. In the original order of the Commission (4 W. R. C. R. 233 as modified in 4 W. R. C. R. 788 and 5 W. R. C. R. 110), subsequently vacated by the supreme court (144 Wis. 523), the Commission acted on the basis that private tracks laid upon the premises of a private company for the convenient operation of its industries do not form a part of the railway company's system. If we are in error in this and the Commission has authority to thus extend private tracks, constructed upon the premises of industries for the purpose of conveniently handling the in and out traffic of such industries, it is important that the matter be not left in doubt. From the language of the court it would seem that such authority exists, but as we are unable to find that the attention of the court was directed to the question here suggested, we hesitate to accept the conclusions reached as final, and trust, if the matter should again reach the supreme court for decision, that the question may be positively determined. *Eden Independent Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 140, 147.

RIGHT OF SHIPPER TO SWITCH CONNECTIONS.

Spur track, construction of, ordered by Commission.

2. The previous order of the Commission (4 W. R. C. R. 233 as modified in 4 W. R. C. R. 788 and 5 W. R. C. R. 110) for the extension of a spur track at Marblehead, Wis., in the town of Eden, Fond du Lac Co., Wis., having been vacated by the supreme court (*Union Lime Co. v. Railroad Commission*, 1911, 144 Wis. 523) a new petition in the matter was filed. The testimony offered in the present proceeding is in every material respect identical with that given on the former hearing and the conclusions there reached have not been modified by anything disclosed in the present investigation of the matter. *Held:* The spur track in question is practically indispensible to the successful operation of the petitioner's lime kiln and quarry. Its construction and operation is not unusually unsafe and dangerous, and it is not unreasonably harmful to public interest. The respondent is ordered to construct a spur track according to the provisions prescribed by the Commission within sixty days. If for any valid reason compliance with the order cannot be made within such period the Commission will extend the time upon application. *Eden Independent Lime & Stone Co. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 140, 146–148.

SWITCHING CHARGES

See Terminal Charges.

As matter considered in making joint rates, *see* Rates, 38.
Reasonableness of switching charges, *see* Rates, 66.

SWITCHING SERVICE

Jurisdiction of Commission over switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff, *see* Railroad Commission, 5.
When interstate and when intrastate, *see* Transportation, 1.

TAPPED LINE

Railway, operation of, as a tapped line, *see* Rates, 43.

TARIFFS

See Schedules or Tariffs.

TAXES

Apportionment of taxes in the determination of unit costs for water utilities, *see* Accounting, 39–40.

TELEPHONE UTILITIES

Classification in telephone service, *see* Classification, 2.
Cost of service of telephone utilities, determination of unit costs, *see* Accounting, 15–17.
Depreciaton, rate of depreciation of telephone plant, *see* Depreciation, 6–7.
Discrimination between telephone subscribers, *see* Discrimination, 1–3.
Discrimination between telephone subscribers, different rates for different classes of service, not necessarily unjust discrimination, *see* Discrimination, 1; Rates, 87.
  different rates to stockholders and non-stockholders, *see* Discrimination, 2.
  different rates to subscribers on account of ownership of instruments or facilities, *see* Discrimination, 3.
Extension sets, separate price of extension sets, *see* Rates, 88.
Rebates or concessions, allowance to subscriber of telephone utility on account of ownership of instrument or facility, rate concession prohibited, *see* Rebates or Concessions, 1–3.

ACCOUNTING.

See Accounting.

CONTROL AND REGULATION IN GENERAL.

Power of municipality to regulate location of poles within the streets or other public places.

1. All legislative grants to private corporations to occupy streets with electrical appliances are impliedly, if not expressly, subject to the police power of the municipality, both to dictate and to change the location of such plants. *(Monongahela v. Monongahela E. L. Co.* 1892, 4 Am. El. Cas. 53.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 445.

2. That, in the exercise of this power, the city authorities may go so far as to prohibit the encumbering by telephone poles of certain of its streets, in the exercise of a reasonable discretion, is equally clear.

Such right necessarily follows from the grant of the power to regulate. It is also implied from the fact that the dominant purpose of a street is for public passage, and any appropriation of it by a legislative sanction to other objects must be deemed to be in subordination to this use, unless a contrary intent is clearly expressed. *(Marshfield v. Wis. Tel. Co.* 1899, 102 Wis. 604, 610, 611.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 445.

3. The authorities are unanimous on the proposition that the municipality may, in the first instance, control the location of poles and electric wires in the streets, but after having once granted the right to the use of the streets for such purpose and the company having complied with and constructed its line according to the terms and conditions of the grant, the municipality cannot, in the exercise of the police power, according to some authorities, change the location and thus impose a burden upon the company, except it be clearly shown that public safety or convenience requires such change. *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 445–446.

4. A city may not enforce an ordinance peremptorily directing a telephone company to re-locate its poles in an impracticable manner, after the poles have been located and allowed, when it is neither averred nor shown that the existing location incommodes the public, nor that there was any good reason for the removal of the poles. *(Hannibal v. Mo. & K. Tel. Co.* 1888, 31 Mo. App. 23.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 446

5. That the rights of the defendant in the streets of the city must yield to the public necessity or convenience is beyond question or dispute; but, having acquired a right in the streets, and having made expenditures on the strength of the grant extended by the city, the authorities are quite uniform that this right cannot be taken away in an arbitrary manner and without reasonable cause. * * * That the city council may make reasonable regulations relating to the maintenance and repair of the defendant's plant is not open to argument; but such regulation is not to be exercised at mere whim or caprice. It must be proportionate to, and commensurate with, the public necessity for the protection and promotion of the public health, safety, necessity or convenience. The application of the police power cannot be extended by the authority which is entrusted with such application to an arbitrary misuse of private rights. That the city may order the removal of poles which endanger the citizens because of a rotten condition, and protect its inhabitants against any conduct of the business which endangers the public health or safety, is not a question open to dispute. *(Plattsmouth v. Neb. Tel. Co.* 1908, 80 Neb. 460, 466–467.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 446.

6. An electric company, which has been granted, by the legal authorities, the right to use the streets, and has constructed its line in compliance with and in reliance upon the terms and conditions of such grant, cannot be made the subject of new conditions, aside from what may necessarily be required of it by the city in proper exercise of the police power and the control and regulation of the streets. *(Northwestern Tel. Exch. v. City of Minneapolis*, 1901, 81 Minn. 140, 147.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 447.

7. The requirements to build conduits through ungraded streets in suburban parts of the city and in the open country are clearly, upon its face, unreasonable, and the claim to exercise such right on the part of the common council of the city at their "will and mere motion" cannot be sustained in the reasonable exercise of the police power, or upon any theory that is consistent with the acquired and vested rights which the plaintiff enjoys under the constitution and the laws. *(Northwestern Tel. Exch. Co. v. City of Minneapolis*, 1901, 81 Minn. 140, 148.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 447.

8. A city has the right to enact reasonable ordinances, and to enforce them but it is the conservator, and not the autocrat, of the police

power. It may originate the exercise of its useful authority, and apply it by specific and valid regulations; but that exercise is not despotic, nor absolute, but is open to review, and an ordinance that upon its face is unreasonable and arbitrary is subject to judicial examination. When it is not bounded by fair and wise administration of municipal authority, but is unreasonable and arbitrary, it will be declared void, and the municipality restrained from its enforcement. *(Northwestern Tel. Exch. Co. v. City of Minneapolis*, 1901, 81 Minn. 140, 149.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 447–448.

9. It is not the ascertainment of the rule, but the application of the same to the particular state of facts under consideration in any particular case that is often difficult in determining whether municipal action upon the subject is reasonable or unreasonable, as the line of demarcation between what is required and what is not required to subserve the convenience or necessity of the public in the premises is not always clear or indisputable; and, hence, it would seem that in case of any doubt the same should be resolved in favor of the legality of the regulation imposed by the municipality upon the public utility. *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 448.

10. In the present case we do not deem that the cost of moving the poles and setting them in the adjoining alley would, in itself, be an adequate reason for declaring a proper ordinance or resolution of the common council requiring such alteration in the system of the telephone company void because imposing an unreasonable regulation. Such cost would be no more than commensurate with the public convenience resulting from the change. Nor is the difficulty in making such change, as contended by the petitioner, of sufficient consequence to stay the act of the city designed to accomplish a laudable civic enterprise. *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 449.

11. Under the facts disclosed in the instant case, it would seem that the authority of the city to cause the poles to be removed from a street upon which it has expended considerable money for the purpose of converting it into a boulevard and driveway, for which it is suitably adapted because of its location upon the bank of the river, ought to be conceded; otherwise the purpose of cities to thus devote public thoroughfares to certain uses for which they are peculiarly fitted by nature would often be thwarted. *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 449.

12. I can have no doubt that it is entirely competent for the city authorities, unless they are bound by some absolute contract permitting the poles and wires to stand as they are, to have them removed and put an end to such unsightly obstructions as these poles and wires are now in our streets. There must be a power, I think, somewhere, to cause them to be removed, and to regulate and control the manner in which telegraph lines shall enter and pass through the city. *(Mutual Union Teleg. Co. v. Chicago*, 1883, 16 Fed. 309, 315.) *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 449.

13. Petitioner alleges that a resolution and order of the authorities of the city of La Crosse, Wis., requiring the removal of petitioner's poles and wires from South Front street is grossly unreasonable, arbitrary, discriminatory, invalid and void. It appears that this street has been permanently paved by the city and considerable money was expended in improving it and adjoining property used for park purposes; that it is a driveway overlooking the Mississippi river; that the beauty of the street is greatly marred by the unsightly poles that line both sides; that the poles could be moved, without much difficulty, to adjoining streets and alleys; that in case of fire, difficulty and danger might be incurred by the fire department in reaching the fire, because of numerous wires strung upon the poles in close proximity to the buildings. *Held:* The right given to telephone companies by sec. 1778, to construct and maintain their lines upon, in, along, across, or beneath the

surface of any public road or highway, is subject to all reasonable regulations by the municipality, and in the exercise of its police power, the municipality may, in a proper case where public safety, necessity or convenience requires, order the removal of telephone or electric poles from any thoroughfare, and the wires to be placed in conduits or the poles to be moved to another location. The order which the petitioner is required to comply with does not call for the laying of the wires in conduits, but the removal of poles and wires to adjoining streets, alleys or private right of way, the expense of which would not render the regulation unreasonable and would be no more than commensurate with the public convenience resulting from the change. The demand for the removal of the poles is not unreasonable under the circumstances. The resolution is a reasonable regulation and valid. The petition is dismissed. *Wis. Tel. Co. v. City of La Crosse*, 1911, 7 W. R. C. R. 435, 445, 448, 450.

TELEPHONE COMPANIES.

Capital stock—Requirement as to ownership of stock by subscribers.

14. The requirement that all subscribers must own a share of stock in the company, is of doubtful legality, but it is not considered necessary at the present time to pass upon the matter. *In re Appl. Morris Tel. Co.* 1911, 7 W. R. C. R. 426, 427.

RATES.

See Rates.

VALUATION.

See Valuation.

TERMINAL CHARGES

Reasonableness of rate, switching charge considered in relation to reasonableness, *see* Rates, 66.

TERMINAL EXPENSES

Apportionment of terminal expenses in the determination of unit costs of transportation, *see* Accounting, 13–14.

As element considered in making railway rates, *see* Rates, 51.

TERMINAL FACILITIES

See Station Facilities; Switch Connections.

TOWNS

See Municipalities.

THROUGH LINES

See Connecting Carriers.

THROUGH RATES

Joint or through rates and divisions thereof, *see* Rates, 38–44.

TILE

Rates, reduction of distance tariff and establishment of joint rates, Wisconsin points, *see* Rates, 40–41.

TON-MILE EXPENSES

Apportionment of ton-mile expenses in the determination of unit costs for transportation, *see* Accounting, 14.

As matter considered in determining reasonableness of railway rates, *see* Rates, 60.

TRAFFIC DIVERSITY FACTOR

Traffic diversity factor as matter considered in determining adequacy of service for street railways, *see* Street Railways, 5.

TRAIN SERVICE

Village, unincorporated, deprived of train service by change in line, *see* Railroads, 10.

Adequacy of train service.

1. Petitioners allege that the passenger and freight service at Grantsburg, Wis., are inadequate. *Held:* The present passenger train service is inadequate. Respondent is ordered to run an additional train carrying passengers on its line between Grantsburg and the west boundary line of the state of Wisconsin, so that the citizens of Grantsburg and vicinity may have reasonable passenger service twice daily each way, except Sunday. *Nelson et al. v. N. P. R. Co.* 1911, 7 W. R. C. R. 764, 769.

TRANSIT PRIVILEGES

GRANTING OF PRIVILEGE IN SPECIFIC CASES.

Restoration of privileges to shippers of live stock.

1. Petitioners complained that the tariff formerly in effect on respondent's lines allowing one stop in transit to finish loading of live stock, had been changed so that it is now necessary to ship from originating point to stopping point, and from stopping point to destination at the sum of the two locals. This change amounts to a material increase in rates. It was contended by the respondent that the principal reason for the change was to avoid delay in stock shipments. It was shown that the change did not materially affect the time of shipments, and that its principal effect was to increase rates. *Held:* The withdrawal of the stoppage in transit privilege resulted in an unwarranted increase in rates throughout the state on stock shipments stopped to finish loading. Respondent received sufficient compensation in its regular rates on live stock, and in the additional charge for stoppage privilege to warrant an order requiring reinstatement of such privilege in the form in which it was formerly in effect. Since the scope of this proceeding does not cover all of the respondent's lines, the restoration of the transit privilege is ordered only for the stations named in the complaint. It is recommended that such privilege be reinstated generally on the lines of the respondent throughout the state. *Arries & Peckham et al. v. C. & N. W. R. Co.* 1911, 7 W. R. C. R. 131, 139.

TRANSIT RATES

See Rates.

TRANSPORTATION

WHAT TRANSPORTATION IS INTERSTATE AND WHAT INTRASTATE.

Switching service—Switching of commodities brought from points outside of the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff.

1. In *Duluth-Superior Milling Co. et al. v. N. P. R. Co.* 1910, 6 W. R. C. R. 70, the Commission considered the question of its jurisdiction over the switching of commodities brought from points outside of

the state when the switching is not done under the original contract of transportation but is a distinct movement governed by the local switching tariff. It is held that the service in question was an intrastate transaction and therefore within the jurisdiction of the Commission. *Duluth-Superior Milling Co. v. N. P. R. Co.* 1911, 7 W. R. C. R. 459, 461.

ULTRA VIRES

Usurpation of franchise or exercise of unauthorized powers by a railway company, *see* RAILROADS, 13.

UNDUE PREFERENCE

See DISCRIMINATION.

UNIFORM ACCOUNTING

See ACCOUNTING.

UNIT COSTS

Determination of unit costs for electric utilities, *see* ACCOUNTING, 1–6, 10–11.
for gas utilities, *see* ACCOUNTING, 7–9, 10–11.
for railroads, *see* ACCOUNTING, 12–14.
for telephone utilities, *see* ACCOUNTING, 15–17.
for water utilities, *see* ACCOUNTING, 11, 18–48.

UNIT PRICES

Basis of unit prices in the valuation of property of public utilities, *see* VALUATION, 23–26.

UNJUST DISCRIMINATION

See DISCRIMINATION.

UNJUST RATES

See RATES.

UNREASONABLE RATE

See RATES.

UTILITIES

See PUBLIC UTILITIES.

VALUATION

DETERMINATION OF VALUE OF PROPERTY OF PUBLIC UTILITIES—ELEMENTS CONSIDERED.

In general.

1. The valuation placed upon utilities depends, to some extent at least, upon the purposes for which it is intended. For instance, in valuing utilities for the purpose of condemnation and purchase, many elements must often be taken into account which should not be given any consideration in valuations made for the purposes of rate making. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 72–73.

2. In determining the value of the physical property of a public utility several elements must be taken into consideration. The three elements of greatest importance in fixing the value of such plants are the original cost, the cost of reproducing the plant, and the present value. As to which of these elements shall be given the greatest consideration, must depend upon the circumstances in each case and must also depend upon the purpose for which the valuation is made. *(Hill et al.*

v. Antigo W. Co. 1909, 3 W. R. C. R. 623, 631.) *(In re Menominee and Marinette Lt. & Tr. Co.* 1909, 3 W. R. C. R. 778, 785–787.) *(State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 557.) *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 74.

3. The original cost of the property, subsequent additions to and investment in the plants, and the present value and cost of reproduction, are elements which must largely determine the investment upon which the respondent in the present case is entitled to earn a reasonable return. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 255.

4. In fixing the value of a property for rate-making purposes, consideration should be given, on the one hand, to the ability of the utility to meet the reasonable demands placed upon it by its consumers, and to the existence of investment beyond the reasonable demands of the present or near future on the other. *City of Neenah v. Wisconsin Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 480.

Franchise values.

5. The rights to do business in a particular city, which rights have been granted free of cost, can hardly be legitimately capitalized by utilities which are not entitled to more than reasonable returns on their investment. *(State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 578.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 277.

Going value—Net cost of building up the business.

6. The Commission has recognized the element of going value as one which is properly considered in determining the value of a utility upon which the reasonable return must be computed. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 276.

7. The costs of developing the business of a public utility are as much a part of the investment in the business as the physical structure. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 277.

8. For public utilities which, under both the common and the statute law, under normal conditions are only entitled to reasonable returns on the investment, justice as well as equity appears to demand that the amounts, if any, by which they, under ordinary conditions, have failed to earn such returns, should be considered in fixing values and rates for such plants. *(State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 585.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 277.

9. The early losses or deficits, or the amounts by which the earnings of the plant have failed to meet the ordinary operating expenses and taxes, and provide for depreciation and a reasonable return on the investment, will closely measure, in most cases, the cost of developing the business. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 277.

10. In allowing for the cost of developing the busines it is not meant, however, that deficits from operation can be equitably taken into account in the appraisals or rates regardless of the conditions under which they were incurred. As already stated, when such deficits are due to abnormal conditions, or when due to bad management, defective judgment, extravagance, lack of ordinary care and foresight, unduly high capital charges, and other causes of this nature, it is manifestly clear that they should be accorded little or no consideration in either the valuation or the rates. *(State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 585, 586.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 277–278

11. In estimating the amount for going value no allowance should be made for deficits which were incurred under and borne by others than

the present owners, and which have been wiped out in the various transfers of ownership. That these propositions are, as a rule, sound and equitable, appears to be so clear as to need no further argument. (*State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 586.) *City of Beloit v. Beloit W. G. & E. L. Co.* 1911, 7 W. R. C. R. 187, 277-278.

12. The amounts spent in litigation in the early history of the company in the present case were not incurred in connection with the performance by the company of its service to the public and cannot be capitalized and treated as a part of the going value. It would be an injustice to the consumers to compel them to pay dividends on money which had been spent without increasing, in any way, the value of the property, either in a physical sense or as a going concern. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 508-509.

13. Going value is an element which depends upon the circumstances in each case, and cannot be determined arbitrarily. The addition of an amount to cover going value depends upon the condition of the business and not upon a rule which would give to all concerns a going value, regardless of their financial situation. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 512.

14. Every water plant naturally goes through a period of development, during which people come to appreciate the advantages of being supplied with water under pressure, but in the present case this period has been unusually prolonged. In a case of this kind it is a question how much of the losses during the developmental period should be considered as adding an element of going value to the property. For example, if a utility is established in a city far in advance of the needs of the community, the losses during the early years of its operation may be very great, so much so that to consider these losses as adding to the going value of the utility would make the apparent value out of all proportion to the physical value. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 513.

15. In the present case the failure of the plant to earn large dividends during the early years of operation appears to have been due to the establishment of the plant before the wants of the people made it necessary. Charges were made without reference either to the provisions of the franchise or the interests of the business and no appreciable effort appears to have been made during this time to extend the business accordingly. Only a small amount is allowed as going value. To make a large allowance for going value, under the circumstances of this case, would be equivalent to capitalizing the losses incurred through careless and unprogressive management. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 513-514.

16. There is admitted to be a speculative element in the water supply business, and in the present case it appears that the development of the business did not fulfill the expectation of the promoters. If the community was in need of the utility for commercial and industrial water supply, the losses during the developmental period, assuming that the management was economical and efficient, would in reality form a part of the investment. If this situation does not hold, it is easy to conceive of a condition where the losses, added to the physical value, would soon reach such an extent that it would be impossible ever to earn dividends on such a valuation. If, then, the revenues during fourteen or fifteen years of operation were insufficient to provide for depreciation and a reasonable return on investment, it does not seem to be just to present consumers to add all these losses to the physical value. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 513-514.

17. Whether going value should constitute an addition to the cost new of the property, or to the value in its present condition, is a matter which must be decided largely on the circumstances in each individual

case, or, rather, cost of reproduction new, physical value in present condition, original investment, and going value are all elements to be considered in ascertaining the actual value of the property. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 515.

18. In view of the fact that the failure of the plant to earn large dividends during the early years of operation appears to have been due to the fact that it was established before the wants of the community made it necessary, that charges for water seem to have been made in a slipshod manner, without reference either to the provisions of the franchise or the interests of the business, and the further fact that no appreciable effort appears to have been made during this time to extend the business, it seems that only a small amount can be allowed as going value because of the cost of building up the business. To make a large allowance for going value, under the circumstances in this case, would be equivalent to capitalizing the losses incurred through careless and unprogressive management. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 516.

19. If losses are due to poor management during the period in which the business should normally be developing, it is not fair to the customers of the utility to add these losses to the physical valuation under the name of going value. The cost of building up the business, or the "cost of going value," ought to be clearly distinguished from the cost of unprogressive management. The greatest difficulty, of course, is to make such a distinction and to reduce it to terms of dollars and cents. It is not possible to make a mathematically accurate separation of these two items of expense, but from the facts in this case it seems that a large part of the losses during the first years of operation was due to managerial oversights or inefficiency, and such part should not be made in any form a charge against the consumer. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 516–517.

Going value—Net cost in building up the business—Cost charged to capital account or gradually charged off from earnings.

20. Expenditures for the development of the business, when reasonable and when well placed, would, therefore, seem to be legitimate and to constitute a charge, that, in some form, should be borne by the customers, or by those who avail themselves of the service in question. Whether these expenditures should be charged to construction and thereby become a permanent charge on the consumers, or be charged to the operating expenses and thereby be wiped out about as incurred, are questions that cannot be settled independently of the surrounding conditions. When the rates and the earnings of the utility are such as to yield a reasonable return to the investors if the expenditures in question are included in the operating expenses, then "operating expense" appears to be the place to which they should be charged. When, on the other hand, the rates and the earnings are not high enough to permit these expenditures to be charged to operating expenses without resulting in less than reasonable returns on the investment, then it would seem that until the earnings become adequate, at least, they should be charged to the cost of the plant. *(State Journal Prtg. Co. v. Madison G. & El. Co.* 1909, 4 W. R. C. R. 501, 589.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 215.

Going value—Net cost of building up the business—Whether an addition to cost of reproduction new or present value.

21. There may be a question as to whether the increment for going value should constitute an addition to the cost new of the property or to the value in its existing condition. If the cost new is the basis, it

may be said, in general, that the going value estimate should take into consideration a rate of return which should provide only for return on property and not for depreciation, for if the cost new is used, allowance is thereby made in the valuation for such amount as should have been set aside to cover depreciation. On the other hand, if the present value is used, the rate of return which is considered in arriving at the going value must be a rate which will cover interest and profits, and also depreciation. In the present case it seems that the allowance for going value constitutes a considerable addition to the existing value, but not a large increase in the cost new. ***City of Janesville v. Janesville W. Co.*** **1911, 7 W. R. C. R. 628, 642.**

Monopoly value.

22. In the present case the company claimed a value for its water supply over and above the cost of development and the value of the physical property utilized. The company rested this claim chiefly on the contention that the company has the only developed source of ground water supply in the vicinity and that to secure an equally pure and satisfactory supply would necessitate either the construction of an expensive intake into the waters of Lake Michigan or the location, purchase and development of an equally good ground water supply. On these grounds the company contended for a large value for its water supply as distinct and separate from the physical property necessary in its utilization. ***Held:*** **The value of this supply does not exceed the cost of developing and discovering the same, as estimated by the engineers of the Commission.** ***In re Manitowoc W. Wks. Co.*** **1911, 7 W. R. C. R. 71, 105, 130.**

Physical property—Basis of unit prices.

23. Cases followed in determining basis of unit prices: ***City of Appleton v. Appleton W. Wks. Co.*** **1910, 5 W. R. C. R. 215, 228. Followed in** ***In re Manitowoc W. Wks. Co.*** **1911, 7 W. R. C. R. 71, 83.**

24. Whether the prices should be based on a ten year average, five year, two year, or one year average, may properly be a matter for consideration but in view of the facts as regards the variation of current prices from month to month, it does not appear just or reasonable to allow current prices to govern in the determination of value, either for the purpose of sale or rate making. ***In re Manitowoc W. Wks.*** **1911, 7 W. R. C. R. 71, 85.**

25. It is not believed to be either just or reasonable to permit current prices due to temporary and abnormal conditions to govern in the determination of value either for the purpose of sale or rate making. ***In re Manitowoc W. Wks. Co.*** **1911, 7 W. R. C. R. 71, 128.**

26. Cases followed in determining basis of unit prices: ***Hill et al. v. Antigo W. Co.*** **1909, 3 W. R. C. R. 623, 679–682.** ***City of Appleton v. Appleton W. Wks. Co.*** **1910, 5 W. R. C. R. 215, 228–235. Followed in** ***City of Beloit v. Beloit W. G. & El. Co.*** **1911, 7 W. R. C. R. 187, 211.**

Physical property—Cost of reproduction new—Allowance for item of cost not actually incurred—Paving.

27. The question as to the inclusion of the value of the paving over the mains which has been laid since the mains were put down and which the company has never had to cut through and replace, has been discussed in several decisions of the Commission. No allowance will be made for paving which the company was not compelled to remove when laying its mains and services. • ***(City of Ashland v. Ashland W. Co.*** **1909, 4 W. R. C. R. 273, 307.)** ***(State Journal Prtg. Co. et al. v. Madison G. & El. Co.*** **1910, 4 W. R. C. R. 501, 554–555.)** ***(City of Ripon v. Ripon Lt. & W. Co.*** **1910, 5 W. R. C. R. 1, 10.)** ***(In re Fond du Lac W. Co.***

1910, 5 W. R. C. R. 482, 492.) *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. R., 77, 88–89.

28. The Commission has held in several earlier decisions that the value of paving, where no expense had been incurred by the company, should not be included in a valuation for the purpose of rate making. (*City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 10.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 233.

29. No allowance should be made for paving except where it was actually disturbed by the company. (*City of Ripon v. Ripon Lt. & W. Co.* 1910, 5 W. R. C. R. 1, 10.) *City of Neenah v. Wis. Tr. Lt. H. & P. Co.* 1911, 7 W. R. C. R. 477, 480.

Physical property—Cost of reproduction new—Discounts on bonds.

30. The relation of bond discounts to plant valuation cannot be determined without a knowledge of the circumstances existing at the time of the bond issue. It has usually been considered that when a community is in need of a utility to supply a particular class of service and when money for the construction of the plant can be secured on no better terms, the discount on bonds constitutes a proper charge to capital. In the present case there may be some question as to whether money for construction purposes could not have been obtained on better terms. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 639.

31. In cases where a discount on bonds is necessitated by a low interest rate, the fact that a discount is made amounts to a postponement of a portion of the interest payment until the date of maturity of the bonds. In the case under consideration, however, the interest rate of 6 per cent appears to have been at least as high as the normal rate for such bonds. The fact that these bonds were soon afterward reduced to a 5 per cent interest basis, because the plant was unable to meet a 6 per cent rate, seems to indicate that some discount was necessary to secure capital for construction purposes. On the other hand, that the utility was in poor financial condition may have been due to the fact that the community was not greatly in need of the water plant at the time it was built, or to the fact that not enough allowance was made for working capital during the period in which the business was being built up. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 639.

Physical property—Cost of reproduction new—Engineering.

See post, 32–34.

Physical property—Cost of reproduction new—Interest during construction, engineering, contingencies, etc.

32. Cases followed on allowance for interest during construction, engineering, etc.: *State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 540–546. Followed in *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 88.

33. Cases followed on interest during construction, etc.: *State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 626, 633; *In re Fond du Lac W. Co.* 1910, 5 W. R. C. R. 482, 505, 507. Followed in *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 99.

34. That interest during construction, engineering, legal work, organization expenses, omissions and contingencies are proper elements of cost or value to be included in an estimate of cost of reproduction and existing value of the physical property of plants, has justly been recognized. (*State Journal Prtg. Co. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 540.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 237.

Physical property—Cost of reproduction new—Legal services, etc. during construction.

See ante, 32–34.

Physical property—Cost of reproduction new—Piecemeal construction.

35. Cases followed in determining allowance for piecemeal construction: *State Journal Prtg. Co. v. Madison G. & El. Co.* 1910. 4 W. R. C. R. 501, 546–549. Followed in *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 241.

36. That some consideration should be given to piecemeal construction in making valuations should be admitted. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 241.

Physical property—Cost of reproduction new—Service connections.

37. The petitioners contended that the service connections, the cost of which had been met by the consumers, should not be included in the value of the plant. This contention would also seem to be well taken, for it would hardly be fair to make the consumers pay interest and perhaps other costs on property for which they had met all the charges. (*Hill et al. v. Antigo W. Co.* 1909, 3 W. R. C. R. 623, 693.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 215.

38. It appears to be clearly established in the present case that the charges assessed against the consumers by the company for the installation of services has been in the aggregate sufficient to cover the cost of this work to the company. In view of these facts we are of the opinion that the value represented in the services under consideration, and for which the consumers have paid, is not a fair element in the valuation for the purposes of this case. This applies also to the value of the so-called private mains to the amount which the consumers have paid and have not been reimbursed by the company. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 215.

39. In the present case the city contended that the cost of the services installed at the company's expense is not a proper item of allowance in the valuation, for the reason that they are all located on the private real estate of the consumers and are, therefore, the property of the consumers. The city asserted that this is true at least of that portion of them which is within the lot line, or between the curb and the house. It would seem clear that the same reasons given for excluding the value of the services paid for by the consumers, will make it only reasonable and just to allow the company the full value of the services paid for by the company. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 222.

40. Justice to the company requires that services which it has installed at its own expense should be included in the valuation for purposes of rate making. The same applies to meters which are owned by the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 636.

Physical property—Cost of reproduction new—Superintendence.

See ante, 32–34.

Physical property—Cost of reproduction new—Working capital.

41. Plants which are running or in actual operation, must have working capital as well as fixed capital. In this case the latter, or the fixed capital, is largely represented by the cost of reproducing the plants. while the working capital is, in part, represented by the figures given

for stores and supplies. The stores and supplies given, however, do not represent all the working capital the plants require. Plants of this kind, the same as practically all other business enterprises, must have on hand a reasonable cash balance and other current resources in order to operate economically and effectively. That this is the case, is almost self-evident. *(State Journal Prtg. Co. v .Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 550.) *(Cunningham et al. v. Chippewa Falls W. & Lt. Co.* 1910, 5 W. R. C. R. 302, 316.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 242.

Physical property—Original cost.

42. The original cost of the plant, if the records are properly kept, should prove of great assistance in arriving at a fair value of the property. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 74.

43. The public has a right to expect the exercise of good judgment and reasonable intelligence on the part of those who are responsible for the expenditure of large sums of money in work in a public utility undertaking. If it can be clearly shown that such reasonable judgment and intelligently directed effort was lacking, then it would appear that the original cost is not a true measure of the value of the work in question. If, on the other hand, the work was carried out in accordance with the best available judgment and plans, then it would seem that the extra cost might, on equitable grounds, be entitled to consideration in the valuation of the plant. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 78.

44. The original cost of the plant is also an element that should be taken into consideration in determining its value for rate-making purposes. In fact, this cost is often one of the most important factors that enter into such determination. *(City of Racine v. Racine G. Lt. Co.* 1911, 6 W. R. C. R. 228, 285.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 354.

45. The Commission has frequently found that, in cases where full data as to the original cost of plants were available and where the cost of reproduction had been compiled on the same basis as those used in the present case, the original cost and the cost of reproduction new were not far apart. *(City of Racine v. Racine G. Lt. Co.* 1911, 6 W. R. C. R. 228, 286.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 355.

Physical property—Present value.

46. In the appraisal of all property which is subject to deterioration with use, it is necessary not only to determine the cost of reproduction, but also its value as it exists at the date of appraisal, or, in other words, its present or existing value. The value of depreciable equipment may be said to consist of two elements: First, its value for the use for which it was designed; and second, its scrap or residual value at the end of its useful life. If we assume that the value when new is the cost of reproduction, then, at the end of its useful life the only value which remains is the scrap value. Between these two points the equipment is gradually decreasing in value. There is, however, much difference of opinion as to the progress of this decrease in value. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 235.

47. Where proper depreciation curves have been kept in the past, the present or existing value of a property, as determined by inventory, inspection and appraisal, plus the depreciation reserve, should theoretically equal the cost new of that property. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 236.

Physical property—Present value—As affected by depreciation from crenothrix.

48. It would appear that the presence of crenothrix and its probable

future increase in the present case are elements properly considered in determining the value of the utility for rate-making purposes. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 299.

DETERMINATION OF THE VALUE OF PROPERTY OF PUBLIC UTILITIES—METHODS OF APPRAISAL.

Determination of the value of the physical property of the plant —Cost of reproduction new—Land.

49. Cases followed in determining value of land: *State Journal Prtg. Co. et al. v. Madison G. & El. Co.* 1910, 4 W. R. C. R. 501, 528. Followed in *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 77.

Determination of the value of water power rights—Customary estimates.

50. It seems clear from the expressions of opinions thus made and from the general practice of engineers and other men in valuing water powers that the saving effected by the use of the water power over steam power, especially, measures the value of the water power. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. 187, 247.

51. The rental value and market value methods of appraising water powers are quite often open to objections which destroy their reliability and it appears that it is almost always necessary to fall back upon the method of calculating the saving over steam power and then, by capitalizing this saving, arrive at the total value of the water power. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 247.

52. In previous proceedings before the Commission claims have been made for value of the water right as a separate and distinct value from that of the dam etc., or cost of development of the water power. In this connection the Commission pointed out that from a purely commercial point of view the method of estimating the value of water power rights by the saving effected by the use of water power over steam power may, in the main, be sound. But it is not so clear that this can be said for it when the question is regarded from the point of view of public policy. This method, as stated, places water and steam plants on the same basis. By doing this it necessarily diverts all the advantages that may accrue from such water powers from the public to the private owners. In other words, it appears to deprive a locality of the natural advantages it might otherwise derive from being located near such water powers. If water rights are private property under the law, then all the benefits which accrue from these rights would probably go to their private owners. If, on the other hand, water power rights are public rights rather than private rights, then it would also seem that the public ought to share in any benefits that may be derived from such rights. *(Ross et al. v. Burkhardt Milling & El. P. Co.* 1910, 5 W. R. C. R. 139, 147.) *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 247–248.

53. Referring further to the method of measuring the value of a water right by the saving over steam power effected by the use of such power, it is necessary to inquire closely into the relations between the water power and steam power in the particular plant under consideration, for it is obvious that where steam power is necessary as an auxiliary to the water power, that the saving effected in such case cannot be measured by the actual saving with the steam plant operating as an auxiliary. Such a method of calculating the saving and thus the value of the water right would result in a larger value per horse power for the imperfect water power than would be the case for a perfect or complete water power, calling for no steam auxiliary. *City of Beloit v. Beloit W. G. El. Co.* 1911,' 7 W. R. C. R. 187, 248.

54. In the present case several methods of determining the value of the water power were discussed and it was pointed out that from a point of view of public policy it is questionable whether the allowance should exceed the cost of development and value of the physical property utilized. *City of Beloit v. Beloit W. G. & El. Co.* 1911, 7 W. R. C. R. 187, 378.

VALUE OF ARTICLES CARRIED

As element considered in making railway rates, *see* Rates, 46.

As matter considered in determining reasonableness of railway rates, *see* Rates, 59.

VARIABLE EXPENSES

Apportionment of variable expenses, *see* Accounting, 2–3, 8–9, 11, 15–17, 23–48.

Prorating of variable expenses, *see* Accounting, 4–6.

VEHICLES

Refund on shipments, Milwaukee to Wisconsin points, *see* Rates, 61; Reparation, 15.

VILLAGES

See Municipalities.

Unincorporated village, consent of, not necessary for diversion of railway line, *see* Railroads, 10.

VOLTAGE

Standards of service for electric utilities, uniformity of voltage, *see* Electric Utilities, 2.

WATER POWER RIGHTS

Appraisal of water power rights in the valuation of the property of public utilities, customary estimates, *see* Valuation, 50–54.

WATER RATES

See Rates.

WATER UTILITIES

Cost of service of water utilities, determination of unit costs, *see* Accounting, 18–48.

Depreciation, rate of depreciation of water plant, *see* Depreciation, 8–11.

ACCOUNTING.

See Accounting.

ESTABLISHMENT, CONSTRUCTION AND MAINTENANCE.

Extension of water mains.

1. Complaint was made by the city of Janesville that the Janesville W. Co. refused and neglected to lay mains and make extensions as ordered by the common council. The city alleged that it is necessary that the water company make such extensions in order to serve the public's needs and requirements, that a large number of the residents upon the streets over which extensions were ordered laid are desirous of securing the service of the water company, and that the extensions are needed for fire protection. *Held:* An extension of mains is necessary to provide adequate service in certain districts. The extension ordered by the petitioner on St. Mary's avenue is to be constructed in not less than sixty days. The extensions ordered on Walker street

and on Eastern avenue are to be made, in case the city makes a further order to that effect, and are to be completed within ninety days from the time of the city's further orders. These two extensions are for fire protection only and the added amount to be paid by the city is fixed and determined. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 695, 707–708.

Extension of water mains—Duty of utility to extend mains.

2. A water utility should construct and own its distribution system, at least as far as to the consumer's premises. This being the case, it is difficult to see by what process of reasoning it can be held that the fact that the utility has in the past shifted upon consumers a portion of its rightful duties, the installing of parts of the distribution system, should stand in the way of the utility putting in a main or mains at the present time. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 689.

Extension of water mains—Duty of utility to extend mains—Conditions for extension.

3. That the cost of a new main should not be entirely met by the consumers directly served by that main, is true especially in cases where a main is so situated that further extension of it may be made as occasion arises. In such case the main not only serves to supply the consumers situated along its present course, but will serve the purpose of conveying water to other portions of the distribution system. In such cases it is not possible to isolate the cost of each portion of a main and charge the interest and depreciation directly to the consumers along its course. Since most portions of the distribution system fulfill a function other than the supplying of water to consumers immediately along their course, a rate schedule should consider that parts of the system are interdependent, and treat the system as a unit. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 691.

4. In view of the facts there may be some justification for considering, in this particular case, that interest and depreciation on the extension should be met by the revenue from consumers whom it will serve. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 691.

Extension of water mains—Reasonableness of order requiring extension.

5. In determining the question as to the reasonableness of the order requiring extension, due consideration should be given, not only to the interests of the utility, but to the interests of the consumer and the public. These interests, however, as well as the conditions upon which they depend, vary so much from place to place that it is difficult, if not altogether impossible, to lay down specific rules for extensions of the plant and the business that can be generally applied. In a general way it can, of course, be said that such extensions as the one in question here should be put in at the expense of the plant whenever they bid fair to become fairly remunerative. The term "fair remuneration" may not always stand for like elements. In most instances, however, it is likely to mean that the gross earnings from the additional consumers should be high enough to place them on about the same footing with reference to the cost of the service as that which obtains from the rest of the consumers of the plant who come in the same rate classes in its regular rate schedules. (*Beloit W. G. & El. Co. v. City of Beloit,* 1910, 5 W. R. C. R. 617, 623.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 689–690.

MUNICIPAL ACQUISITION—TERMS AND CONDITIONS OF SALE AND PURCHASE.

Compensation for property—Compensation determined by Commission in particular cases.

6. Notice was filed with the Commission by the common council of the city of Manitowoc, Wis., on Jan. 20, 1911, that by a vote of the majority of the electors it was decided to purchase the plant and property of the Manitowoc W. Wks. Co. A tentative valuation as of date Jan. 1, 1911, found the total cost new of the physical property of the plant, including paving, and stores and supplies, and non-operating property, to be $249,440, and present value $231,647. Investigation was made by the Commission in regard to the capitalization of the plant, its original cost, its subsequent extensions and additions to property, its cost of reproduction, its present value and its earning value especially since its acquirement by the present management, and the adequacy and character of its water supply. *Held:* The value of the property used and useful for the convenience of the public in this proceeding, is the sum of $236,000, plus the value of the materials and supplies on hand at the time of the transfer of the ownership of the plant, and plus also the cost of any extensions that may have been made since Jan. 1, 1911, up to the time of the transfer. *In re Manitowoc W. Wks. Co.* 1911, 7 W. R. C. R. 71, 127-130.

OPERATION.

Requirements as to service and facilities—Adequacy of service.

7. Petitioners allege that the water works system in the city of La Crosse, Wis., is unable to supply the demand for water; that the mains are too small and the pressure inadequate during a large part of the summer season; that the intakes in the river are often buried in sand, and that they are now cut off on the city side of the main channel, so that sewage is pumped into the water mains, thereby endangering the health of the people. The water is now taken from the Mississippi river, and an investigation showed that the continued use of this water, whether drawn directly from the river or from a lagoon in the city park, would require the installation of a filtration plant. An investigation was made of the ground water supply available, and for this purpose six test wells were driven and the capacity of the wells was determined. The water from the wells was analyzed chemically, examined bacteriologically, and compared with the water from the Mississippi river. *Held:* The ground water supply is adequate and the quality excellent. It is recommended that the city of La Crosse buy at least eighty acres of the land where the test wells were driven, and at once proceed to develop a municipal supply from the underflow gravel in the valley of the La Crosse river. It is ordered that the city of La Crosse take the necessary steps for securing and maintaining permanently a reasonable supply of wholesome water, and that it place its machinery and appliances in the proper condition to maintain adequate pressure for serving its consumers and for extinguishing fires. Eighteen months is deemed a reasonable time within which to comply with this order. *Torrance et al. v. La Crosse Board of Water Comm'rs.* 1911, 7 W. R. C. R. 27, 39, 40.

Requirements as to service and facilities—Appliances for the measurement of product or service—Duty of utility to provide meters.

8. It is the duty of the utility to install meters at its own expense unless exempted from so doing by the Commission. In the present case

the company is ordered to install meters in certain cases, and consumers are given the right to install meters at their own expense. *In re Appl. Oconto City W. Supply Co.* 1911, 7 W. R. C. R. 497, 549.

9. There seems to be no question that the maintenance of meters, whether owned by the utility or by the consumer, is an expense which should be borne by the utility. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 644.

10. The logic is overwhelming to the effect that meters constitute a part of the facilities incident to the service for which the management, whether public or private, is responsible. (*In re Invest. of the Hudson Municipal W. Wks.* 1908, 3 W. R. C. R. 138, 146.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 644.

11. If the utility is responsible for the accuracy of the meters used, it is clear that the maintenance of those meters is a duty of the utility, and the expense of such maintenance is a proper charge to operating expenses. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 644.

12. The law clearly contemplates that the divided ownership of parts of the equipment of public utilities shall cease, and that all responsibility for the installation and maintenance of the whole of the equipment shall be centered exclusively in the management. (*In re Invest. of the Hudson Municipal W. Wks.* 1908, 3 W. R. C. R. 138, 141.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 681.

13. Under the Utilities Law no utility can compel a consumer to acquire by purchase a meter, or any other part of the facilities which properly belong to the body of facilities which the utility is expected to furnish. (*In re Invest. of the Hudson Municipal W. Wks.* 1908, 3 W. R. C. R. 138, 142.) *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 681.

14. It is the duty of the utility to sell to all consumers through meters unless exempted from so doing by the Commission. Although no demand has been made in this case for a general extension of the meter system, this fact does not remove the company's obligation to install meters. In cases where the meters are now owned by consumers the company is either to buy the meters or to pay the reasonable rental prescribed. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 676, 706.

Requirements as to service and facilities—Services—Duty of utility to provide services.

15. The logical conclusion seems to be that the utility should install and own services to the curb line. The utility, and not the consumer, has the right to occupy the streets, and all pipes laid in the streets should be the property of the utility, and we believe should be put in by the utility. The business of the utility is to deliver its product to the premises of the consumer. If the utility should own the mains through which water is carried to various sections of the city, it seems equally true that it should own all parts of the distribution system as far as the consumer's premises. The service pipe from main to curb is as much a part of the utility's distribution system as is the main itself. Both parts of the equipment have the same purpose: the delivery of water to consumer's premises. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 681.

16. It is not believed that the utility should be required to install and own such portions of the service as are on private property. True, the utility very often owns meters, which are installed on consumer's premises, but such installation is done as a matter of convenience to the utility. As the purpose of the utility is to deliver water to the premises of the consumers, if other conditions were equal, the logical place for the meter would be at the property line. Piping inside the curb line

stands in very much the same relation to the utility as does the piping and plumbing in buildings, and should be a part of the property of consumers. In the present case the services from the main to the curb are hereafter to be installed at the expense of the company. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 681, 706.

Standards of service—Purity of water.

17. Complaint was made by the city of Janesville, Wis., that the Janesville Water Co. pumps water directly from the Rock river, and that such water is impure and unfit for human consumption. An investigation by the Commission showed no evidence that the company is taking any water from the Rock river. *City of Janesville v. Janesville W. Co.* 1911, 7 W. R. C. R. 628, 680.

RATES.

See RATES.

VALUATION.

See VALUATION.

WAY FREIGHT

Rates for way freight haul, *see* RATES, 53–54.

WEIGHT OF ARTICLES CARRIED

As element in judging reasonableness of rates, *see* RATES, 43.

WEIGHTS

MINIMUM CARLOAD WEIGHTS.

Carload minimum on brick, *see* RATES, 41, 63.
on coal, *see* REPARATION, 14.
on coke, *see* REPARATION, 14.

WORKING CAPITAL

As element in the valuation of public utilities, *see* VALUATION, 41.

YARDAGE FACILITIES

See STATION FACILITIES; SWITCH CONNECTIONS.

ZINC ORE

Rates, establishment of joint rates, Wisconsin points on the C. & N. W., the C. M. & St. P. and the M. Pt. & N. lines to Mineral Point, Wis., *see* RATES, 43.

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